THE IRON AGE

THURSDAY, MAY 16, 1889

To Test Boilers for the New Cruiser.

One of Secretary Tracy's first acts on assuming the control of the Navy Department was to revive the Board of Engineers on Experiment at the New York Navy-Yard, which for many years after the close of the Civil War did so much valuable service in ascertaining the practical value of inventions and improvements in steam machinery, boilers and fuses. The new board consists of the ex-chief of the Bureau of Steam Engineering, Charles H. Loring, as president, and Chief Engineer Louis J. Allen as executive, and an assistant. As the new coast-defense vessel must be fitted with them, the board is about to begin experiments with and tests of the various tubular, sectional or coil boilers to determine the best type.

They must be designed to furnish continuously, under forced draft, with due economy, at least three-fourths of the steam necessary to work triple-expansion engines of 4800 initial horse-power at 160 pounds gauge pressure. The boiler which appears to the Department, after investigation, to be the best for the purpose, taking into account the evaporative efficiency, the dryness of the steam, the weight of the boiler, the weight of the water contained, the accessibility for repairs, the simplicity and interchangeability of the parts, the space occupied, the ease of firing and of regulating the feed of the water, the suitability for working in battery, the capability of long-continued steaming without cleaning and the durability, will be adopted in the coast-defense vessel, provided that the price is satisfactory to the Navy Department. Only such boilers as appear to possess merit will be tested for the purpose. The boilers offered for test must be of the type and approximately of the same size as those required by the plans intended for the vessel, and the manufacturers must prepare them for the test at their iron works or at such place as may be arranged with the Department.

An evaporate test of not less than 24 hours' duration, using clean and fresh water, will be made at the rate of combustion proposed to be used on the vessel, all feed-water being measured in tanks to be furnished by the manufacturer, the coal weighed and the steam tested for dryness. Boilers which give good results in evaporation will be further tried by being surrounded by walls representing the adjacent bulkheads on board ship, and joints will be made and unmade in this limited room to prove that repairs can be properly made in the space available. The boiler which gives the best results will be again subjected to a test to show whether or not it will work satisfactorily under the every-day conditions existing on board ship. Several designs have been promised to be submitted.

The Anglo-American Electric Light Company, of New York, are offering treasury stock to enable them to enlarge their manufactory of electrical accumulators.

The Putnam Steam-Engine Valves.

The high-pressure variable cut-off engine made by the Putnam Machine Company, of Fitchburg, Mass., has a wide reputation as being a well-designed and well-built machine. We herewith present several engravings illustrating the valve-gear, the valves being of the double-poppet form. The valves are operated by a side-shaft placed parallel with the axis of the cylinder, and extending beneath the valve-chests and operated by the main shaft through suitable gearings, as shown in Fig. 3. The steam-chests are placed one at each end of the cylinder. On this shaft are placed four cams—one for each valve—shaped as shown in Fig. 4. The cams operate, by raising the free ends, cam-levers, which in turn actuate the valves. The two outer or exhaust cam-levers are journaled to arms projecting from the engine bed, so that their free ends have an up-and-down movement, but no horizontal movement toward or from the cam-shaft. The movement of the exhaust-valves, therefore, is never altered.

The outer ends of the levers operating the inlet-valves are pivoted to the upper ends of arms rigidly secured to a shaft placed parallel with and outside of the cam-shaft, and having at its center a third arm, E, Fig. 4, which extends to and unites with the governor-rod. The governor, of the ball type, is driven by bevel gears from the cam-shaft, and its lower end is slotted to inclose the cam-shaft and extend to the arm E. It is evident that

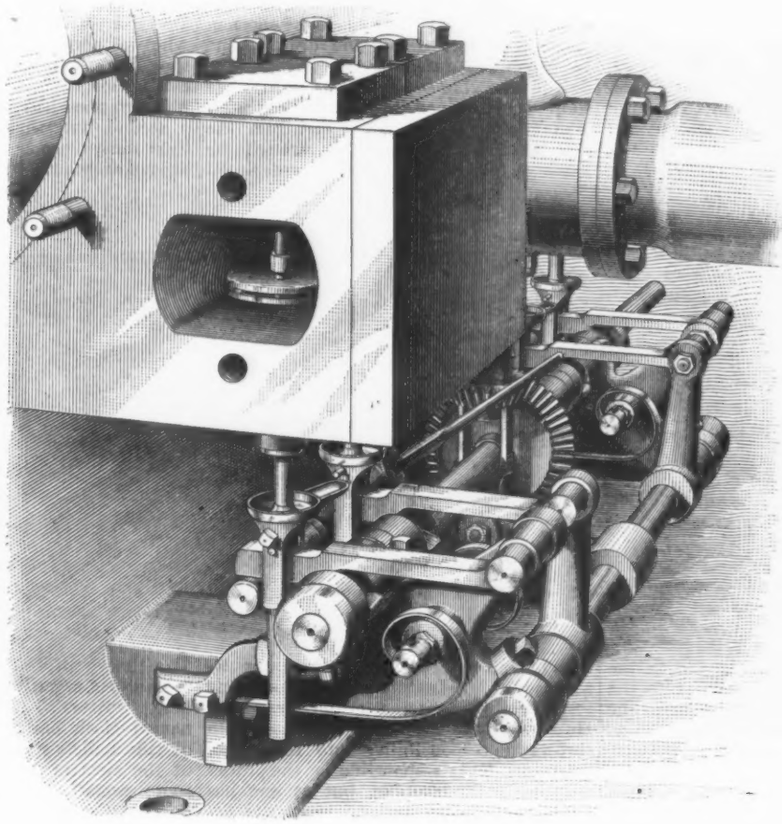


Fig. 1.

THE PUTNAM STEAM-ENGINE VALVES.

the raising and lowering of the governor-rod will partly turn the shaft carrying the arm and thereby move the cam-levers toward or from the valve-stems in a horizontal direction. The free ends of these levers are shaped as shown in Fig. 4, the under side of the lever being cut away on a curve directly over the cam. When the cam-lever is in the position shown in the left-hand cut of Fig. 4 it will not be lifted by the cam, which revolves in the direction of the hands of a watch. The governor-balls are now at their highest possible point. In the right-hand drawings of the same figure the governor-balls are shown at their lowest position, and the cam will now strike the shoulder of the lever and open the valves the longest possible time. The valves are seated by their own weight and by the action of springs arranged as shown in Fig. 1. All jarring of the valve at seating is prevented by the curved form of the shoulder on the cam-lever, which rides upon the cam and brings the valve gently to its seat.

An idea of the form of the steam-passages may be obtained from Fig. 2, which is a view of one of the steam-chests split vertically through the center of the valves, and the two parts opened as if on a hinge D D′ are the inlet and E E′ the exhaust valves. The live-steam enters at C from a passage cored in the side of the cylinder and leading to the supply-pipe, which is placed between the valve-chests. Upon the lifting of the valve D D′ the steam enters the cylinder through the port B. The exhaust is made through the port B and opening A when the valve E E′ is lifted.

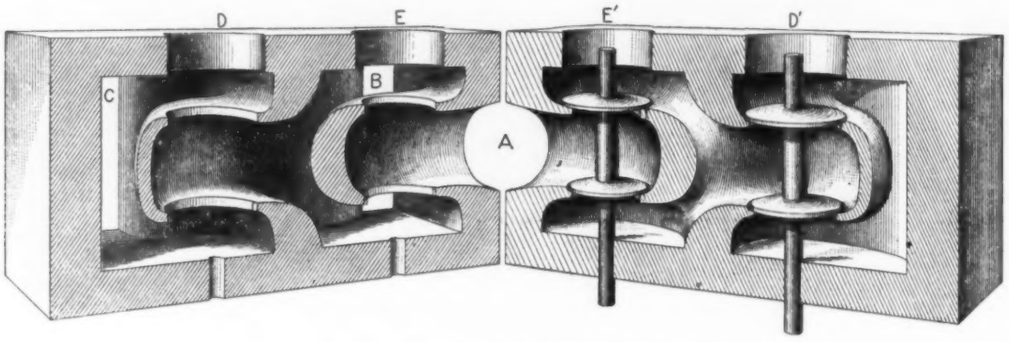


Fig. 2.—Steam-Passages of Putnam Engine Valves.

The Leavitt Drawings.

The drawings made in the office of E. D. Leavitt are almost as well known as the machines they represent, and have earned an enviable reputation not only for the ideas they represent, but also for their accuracy and artistic finish. When it is stated that drawings for the machinery, the execution of which cost over $4,000,000, were so near absolute perfection that less than $2500 was paid for the errors in construction, an idea may be formed of the accuracy of the first conception and the faithfulness of the reproduction in metal. When, further than this, we remember that the apparatus made embodied new principles, was of proportions in many cases without precedent, and which made necessary new forms of construction, we respect the knowledge displayed in the first crude sketch and the skill shown in perfecting it.

The system by the aid of which this has been accomplished in the office of E. D. Leavitt is remarkable mainly because of its simplicity—there is nothing cumbersome about it. The several parts of a new machine are sketched by Mr. Leavitt and described. The drawing and its explanation are then press-copied, so that the many steps for years past can be ascertained by consulting the copying-books. The drawing then passes to the chief draftsman, who assigns the task of reproducing it to scale to one of his assistants. It is drawn upon white paper and inked in, and all necessary dimensions are marked on it. Although the drawing is made to scale, it is the rule to dimension all those parts the size of which the builder must know, and any information necessary to be given beyond the form and size is written near the drawing. The drawings of the machinery for the Calumet and Hecla Mining Company are so self-explanatory that no specifications accompany them.

The original sketch and the drawing on white paper are then passed to another draftsman, who makes a tracing on cloth of all on the first sheet. During his work he checks both the design and the dimensions, and is considerably more than a mere machine copying lines made by another. He must be able to read the drawing and be capable of detecting any error. The finished drawing before being sent to the shop is examined by the chief draftsman, another employee, so that from the first sketch it had passed through the hands of four men, all of whom understood it and all of whom vouched for its accuracy. Mr. Leavitt never assumes any responsibility concerning the drawings. He gives all the necessary data and then throws the responsibility into the office. Of course he is responsible for the proper working of the machine, but as one has never yet failed to perform what was expected of it, his burden is light.

The first drawing is made on white paper, mounted on linen stretched on a board a little larger than the sheet, which measures 40 x 26 inches. The sheet is not removed from the board until the drawing has been completed, and if from any cause work upon any drawing ceases, it is labeled and placed in the safe. All drawings finished are placed in a fire-proof vault, those relating to the same machine being kept together in a drawer just large enough to easily admit the sheets. All those mounted, upon which work has been for a time abandoned, stand in racks made just large enough to admit them, and in similar racks all the drawings which have been worked upon during the day are placed; at night either the white-paper drawing or the tracing is always kept in the office, and a record is kept showing the disposition of all copies, such as blueprints.

During the building of a machine an inspector, appointed by Mr. Leavitt, is stationed at the works He sees that the work done conforms to the requirements of the drawings and from time to time reports. In case of dispute between the inspector and builder the case is referred to Mr. Leavitt, who makes a personal examination and decides the case.

Photographing Projectiles in Flight.

Lieut. Albert Gleaves and Ensign Stokely Morgan have succeeded in photographing a projectile in flight. In Austria last year Professor Anschuetz succeeded in getting a photograph of a rifle bullet, the projectile moving at the rate of 1300 feet a second, and the plate which he used for the purpose being exposed for only .000076 of a second. The two English officers named used a surface Hotchkiss rifle, weight of charge 70 grains, weight of lead bullet 405 grains, with an initial velocity of about 1400 feet a second. Professor Anschuetz, of Lissa, has succeeded in obtaining remarkable and interesting results in photographing the flight of cannon-balls from the moment of their projection to their striking the target or other object aimed at. He demonstrated the perfection of his studies on the trying grounds of the Gruson works, near Buckau. His plates were submitted to the expert, Dr. Koening, of the Berlin University, who was perfectly able to make therefrom the desired practical calculations. He established the fact that the projectile thus photographed had a velocity of 400 meters a second and that the duration of the light thrown upon the photographic plate did not exceed the 10,000th part of a second.

The theory of the motion of projectiles is a subject regarding which volumes have been written. An Austrian chemist named Mash has photographed a number of rifle bullets while in motion by means of the electric light, and thus presented some remarkable phenomena. In this operation his plan is to illumine the bullet by letting it break an electric current, but the velocity of the bullet must exceed that of sound in order that the conditions of the air before and behind the projectile can be shown. After various experiments Mash succeeded in his efforts to photograph projectiles fired from Werndl and Guedes rifles having respectively an initial velocity of 438 and 530 meters per second. The photographs obtained in this manner showed an air formation in front of the bullet having the form of an hyperbola, while behind it almost a vacuum was formed in which, when the initial velocity was great, there were some curious spiral motions From the description given there appeared from these photographs to be a great similarity between the motion of a body through the water and that of a projectile through the air. A use of photography is to make a cannon-ball take a picture of its own wabblings. An arrangement something like a camera is placed in the forward end of a bolt projectile, and when it is fired directly at the sun the light traces lines upon the exposed sensitive plate, from the direction of which experts can afterward tell whether the projectile kept "end on," has "upset," or has kept in one position or wavered to and fro during its flight.

The Pullman Shops.

The unsatisfactory condition of manufacturing establishments which depend upon railroad patronage is well shown in a recent statement published concerning the Pullman shops at Pullman, near Chicago. This report says that among the cabinet-makers and carvers there are usually from 400 to 500 at work, while now there are not over 200. There are less than 60 in the foundry, while there ought to be 700. No work is being done in the steel mill, and 300 men are idle, but it is expected enough work will be on hand in this department in a few days to last a month. There are 150 men in the iron department, while usually there are 500 or 600 at work. In the freight shops only 40 out of 400 or 500 are at work, and these are just finishing up a few caboose cars. Work in this department is slack because of a lack of material and because a new Corliss engine is being put in place. In the store-room the force has not been cut down, but the wages have. The men who received $1.50 per day now get $1.25, and the chief storekeeper's salary has been cut from $150 to $120 per month. Less than 100 men are now working in the lumber-yard, where the regular force is from 200 to 250. The helpers of the steam-fitters have been cut from $1.50 per day to $1.25 per day, and over a dozen have left their work. Some 25 men were laid off from repair-work on the 8th inst. The wood machine department was closed down week before last, and unless more work is forthcoming the claim is made that but very few men will be employed in the Pullman shops in a short time. The officials say it is only temporary and nothing unusual with such concerns as the Pullman company, while some of the merchants and men say things have been getting worse from week to week.

Drifting Test for Steel Angle-Bars.

A drifting test of the toughness of medium steel for structural purposes, recently devised by Hunt & Clapp, of the Pittsburgh Testing Laboratory, has been found to be one of the most effective of the usual tests for ascertaining the quality of the metal. The angle experimented upon measured 6 x 4 x ½ inch and gave the following results when tested in an Olsen machine: The test consisted in punching ¾-inch holes 2 inches from the edge of the angle and 3 inches between centers, and then enlarging the holes to an average of 1¾ inches by the blows of a sledge on a drift pin. In good quality of steel the edges of the holes were found to be sound throughout, while the flow of the metal was plainly indicated. The test is an inexpensive one, and, in the opinion of Hunt & Clapp, is a very satisfactory one. They now use it regularly on all steel which is to be riveted up without reaming, and also in other cases where they wish to demonstrate the qualities of individual bars. It is found that metal which is short or burned or which is too hard chemically will fail under this test. In an article upon this test *Engineering News* says: This test is precisely in the line of a too-limited list of others which substitute a test somewhat approximating the actual destructive strains of service for the bare tension and compression tests, which are all right for the members or parts of members exposed to like strains in service, but which give no absolute indication of how the metal will behave under other than tensile and compressive strains. Rails, for example, are now bought and sold absolutely without an effective test for their real wearing qualities. We have often stated, and now repeat, that the real tests which it is desirable to establish for rails are, first, a wearing test under abrasion; second, a deformation test under impacts of heavy loads at very low velocities; third (and this is the only test for rails now practiced which sheds any real light on their quality), breaking tests under impact. All chemical and mechanical tests other than this merely serve the negative use of excluding exceedingly bad rails. They do not show whether a rail of fairly good metal will wear well or ill in service, but rather often indicate directly wrong conclusions.

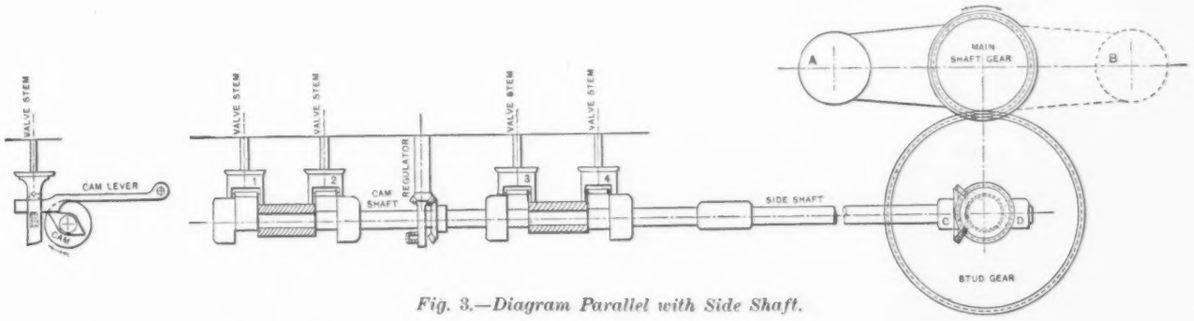


Fig. 3.—Diagram Parallel with Side Shaft.

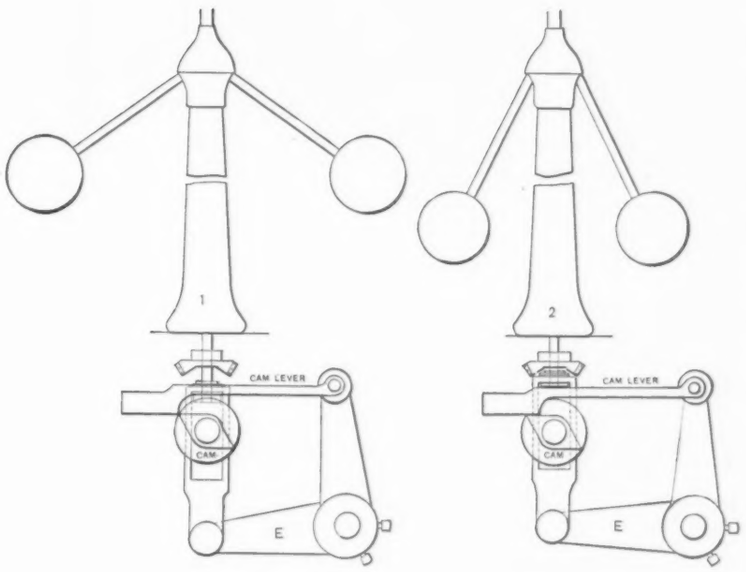


Fig. 4.—Governor and Cams.

Another test of this practical nature, which we may mention for illustration, is Mr. F. M. Wilder's bending test for stay-bolt iron. Finding the ordinary tests gave no direct evidence whether stay-bolt iron would prove good or bad, and reasoning that stay-bolt fractures resulted from bending due to expansion and contraction until the bolt was broken off, as one might break a piece of wire in his fingers, it occurred to Mr. Wilder to imitate these strains exactly. A piece to be tested, 2½ to 3 feet long, was fixed in a vise, and a piece of pipe slipped over it to give a grip, leaving about 6 inches bare next to the vise. Two men then walked around with the end of the pipe until the test piece was bent to a right angle, when they walked back again, and bent it to a right angle the other way. The quality was judged by the number of complete right-angle bends which it was possible to form without fracture, which varied from 4 to 16 in ¾-inch iron sold as good stay-bolt metal, although the same lot would vary only two or three bends. A stipulation that all metal accepted must stand 12 bends resulted in a very speedy improvement in the quality of the metal, and gave the manufacturers a definite criterion, which greatly aided them also by enabling them to determine just what was necessary to fill the requirements. Until consumers determine such standards as this it is quite idle to expect manufacturers to fulfill their expectations. They do not know how to do so, in the first place; and as the consumer will not give them credit for it, in the second place, for lack of a standard of comparison, but will probably buy some other iron ¼ cent per pound cheaper, why should they take the trouble?

The plant of the Susquehanna Iron Company, at Columbia, Pa., which has been idle for some weeks on account of a strike of the puddlers, partially resumed operations on the morning of the 6th inst. The old employees were offered their positions, but refused to accept them. The company expect to have the mill in full operation in a few days.

The Boulton Apparatus for Compressing Steel.*

The Billings process for compressing steel ingots was intended to apply the pressure instantly when the casting was formed, but operated only to lock the gases within the ingot. In experiments tried by William R. Hinsdale, at the Jersey City Steel Works, in the year 1884, it was found that a pressure of 300 pounds per square inch, operating upon a 24-inch piston, and concentrated upon the end of a 3½-inch-square ingot, merely produced an ingot containing innumerable globules of gas. If the pressure was deferred until the ingot slightly hardened a pipe would form in the ingot at the upper end, and would remain permanently, as the hardening would prevent the pressure from operating effectively. The Billings and Hinsdale process provided a reservoir at the top of the mold and a movable plunger within the mold, by which the steel was drawn downward to make an ingot, which would be fed, during the shrinkage period, by the residue remaining in the reservoir. This process is not, therefore, convenient, except for the casting of large ingots. Mr. Hinsdale also experimented at the Jersey City Steel Works with a pressure of 60,000 pounds per square inch upon the metal applied to the end of a 3½-inch-square ingot—nearly double the pressure ever applied by Sir Joseph Whitworth. The result was the shortening of the ingot from 25 to 22 inches in length, and perfect solidity, except that the pipe appeared, in the same form, a flaw, as it ordinarily displays itself at the piped end of a forged bar. Mr. Hinsdale thus found that piping or its effects could not be eliminated by pressure, and invented a perforated plug to insert in the mold upon the top of the fluid metal, through the perforation in which the gases might escape while applying the pressure. With this device the top of the ingot became slightly chilled and a crust formed thereon; but after the pressure upon the metal was raised to about 20,000 pounds per square inch the crust of metal exploded with a loud report, and a circular piece like a boiler-punching shot out of the perforation in the plunger, followed by the gas and sufficient metal to fill the cavity and form a stud as long as one's little finger on the top of the ingot.

This process produced ingots absolutely solid and free from defect, which had been proved impossible by the mere use of pressure. The expense of all these methods and the inconvenience of applying them to the open ingot molds universally used for casting steel ingots resulted in the invention, by Mr. J. B. D'A. Boulton, of Jersey City, N. J., of an apparatus in which ingot molds made without bottom, but in other respects like the common ingot molds, are superposed one part upon another and successively filled, the shrinkage in each ingot being fed by the fluid metal in that above it, and the resulting product being a series of absolutely sound ingots connected by cold-shut joints. An ingot made by this process and split open has been shown to be perfectly sound. By interposing an asbestos washer with a small aperture between the successive mold sections the resulting product was necked at intervals, so that the ingot bar could be readily broken at such points.

Boulton's apparatus, now manufactured by the Solid Ingot Company, of Jersey City, N. J., is shown in Figs. 1 to 8, inclusive, Fig. 1 representing the apparatus mounted over a pit, with a hydraulic elevator to raise the ingots to the floor level; Fig. 2, a vertical section through the cylinder D in Fig. 1, and the parts above it; Fig. 3, an elevation of the elevator at right angles to that shown in Fig. 1; Fig. 4, a longitudinal section on the center line of Fig. 3; Fig. 5, a transverse section on line $x\,x$ in Fig. 4; Fig. 6, a plan or end view of the elevator; Fig. 7, a plan of one mold; and Fig. 8, a side view of the same showing notches k and j, by means of which the mold is propelled through the casting machine and the elevator. The apparatus consists in a spring holder made of two I beams, A A, pressed together by tie-bolts, m, provided with springs, B (2). Hydraulic cylinders, I, are provided with piston-rods, i, to actuate a cross-head, h, which encircles the top of the holder and is provided with pawls, a, Fig. 1, adapted to fit the notches i in the sides of the molds. A transverse cylinder (D, Fig. 1; f^2, Fig. 2) is applied to the bottom of the holder, and contains a piston, $f\,f^1$, Fig. 2, provided with a pocket, e, to receive the molds in succession as they are forced downward in the holder. A spring dog, e^1, sustains the weight of the mold and its contents in the pocket, while the piston is moved laterally, as shown in Fig. 2, and the ingot, while still red-hot, is thus sheared off at the joint of two molds. A spring tongs, s^1, is used to set the molds in the holder, and the lifting of the head h separates the extremities of the tongs and detaches them from the mold. After the pawls a have engaged the notches k the head is moved downward and forces the mold within the holder into position for filling, as shown in Fig. 4. The apparatus is used by first inserting in the top of the holder a mold with a bottom (like that at b^2 in the pocket e in Fig. 2). When filled another mold is superposed in like manner, and the head h and pawls, a, again reciprocated to draw it downward, thus forcing the filled mold further down in the holder. When several molds have been filled, the first contained in the pocket e is shifted transversely by reciprocating the piston $f\,f^1$; and the pocket being restored to a line with the holder, the subsequent downward movement of the molds within the holder discharges the severed mold and its contained ingot from the machine.

The hydraulic pistons are governed by valves shifted by hand levers not shown in the drawing, and the motions of the several parts are thus effected with great ease and rapidity. In practice a cycle of the required movement can be performed in much less than a minute, while it is found that such an interval is required to fill each mold and cool the ingot the desired degree by the time they reach the sharing pocket e.

The molds being formed in longitudinal halves, as shown in Figs. 7 and 8, are readily separated from the castings, which, owing to the perfect feeding of the shrinkage in the progress of the molds through the machine, are absolutely sound and free from piping, and the cast steel is of high density throughout. The gases are also fully discharged from the fluid metal, as their free escape from the top of the metal is always possible. In most instances the machine may be set at such a level as to discharge the ingots at a convenient point for subsequent work; but where it is desirable to raise the ingots to the level of the casting-floor the elevator shown in the figures may be used. The elevator is arranged in an inclined position, with its lower end beneath the casting machine, to receive the molds and their contents and to intermittently raise the same through a guide, E, Fig. 1, to discharge the molds s^2 at the top. This is

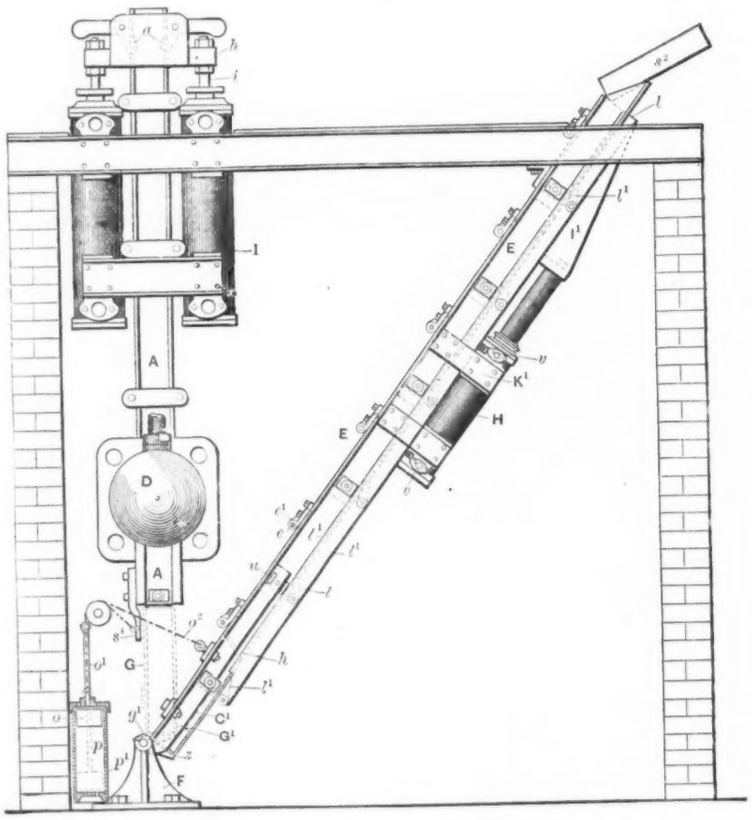


Fig. 1.—Mounted Over Pit with Elevator.

THE BOULTON APPARATUS FOR COMPRESSING STEEL.

* From a paper entitled "The Piping of Steel Ingots," read by T. S. Crane, of Newark, N. J., at the Erie meeting of the American Society of Mechanical Engineers.

effected by providing a box, G, pivoted at one side and held vertical when empty by a counterbalance weight, *p*, operating in a dash-pot, *o*. The entrance of the mold into the box G tips the box over into the guide E, which is provided with a ladder-like frame, *l*, carrying a series of pawls, *l*.

works of Messrs. Spaulding & Jennings since December, 1887, and one ingot per minute is cast in it regularly when the heat is ready. The ingots cast are nearly 4 inches square and are absolutely sound, but the machine is equally adapted to cast larger ingots by making the holder and

Ohio Mechanics' Institute.

We are indebted to James Allison, director Ohio Mechanics' Institute, of Cincinnati, for a copy of the 61st annual report of the Board of Directors of that institution. Perhaps the most interesting

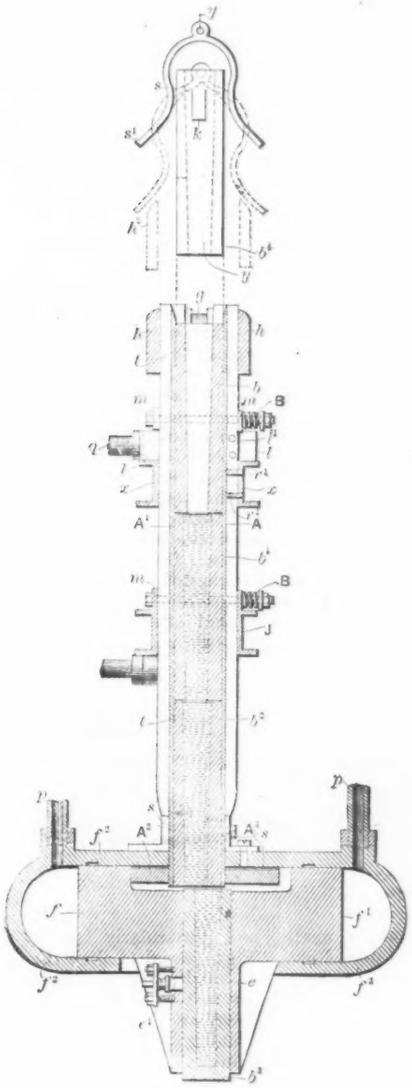


Fig. 2.

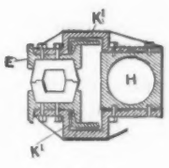


Fig. 5.

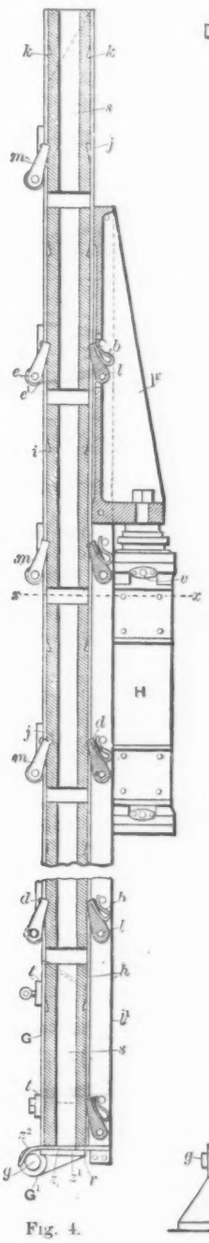


Fig. 4.

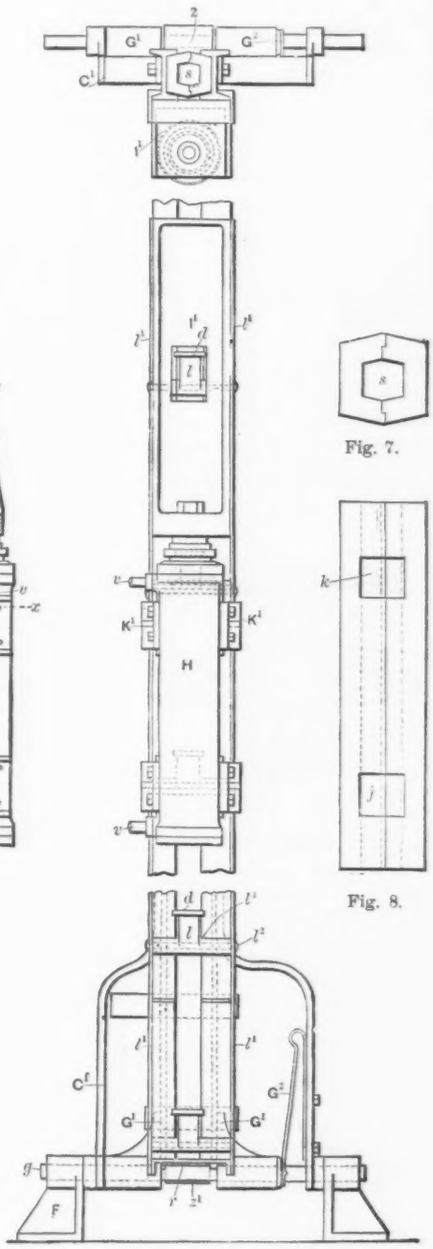


Fig. 3.

Fig. 7.

Fig. 8.

Fig. 2.—Vertical Section through Cylinder D, Fig. 1. Fig. 3.—Elevation of Elevator. Fig. 4.—Longitudinal Section on Center Line, Fig. 3. Fig. 5.—Transverse Section on Line x x, Fig. 4. Fig. 7.—Plan of Mold. Fig. 8.—Side View of Mold.

THE BOULTON APPARATUS FOR COMPRESSING STEEL.

The ladder is reciprocated by the hydraulic cylinder H, and operates to push the molds intermittingly upward within the holder. Pawls, *m*, are provided to hold molds, when the ladder *l* is moved downward for the pawls *l* to engage another mold.

Boulton's apparatus has been in commercial operation at the West Bergen steel

the ingot molds of suitable dimensions. One man suffices to operate the levers of the hydraulic apparatus, and the ordinary operators are employed to pour the metal. The whole operation of forming the ingots is so similar to the use of ordinary molds that no training is needed to use the machine, and it may therefore be regarded as practically perfect.

portion of this report relates to the progress of the industrial and art schools connected with the institute. There are three departments to this school, the mechanical department, architectural department and artistic department, the first having 176 members, the second 148 members and the third 182 members. In the mechanical department students are

instructed in studies relating to the work of machinists, metal workers, foundymen, blacksmiths, pattern-makers, &c. The architectural department is designed especially for carpenters, joiners, builders, masons, bricklayers, &c., while the

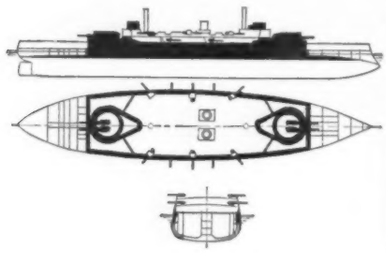


Fig. 1.—New Turret Ship.—Design.

artistic department is for instructions in drawing, painting, carving, silversmithing, ornamental ironworking, decorating, &c. Instruction is given in each department two evenings a week, from 7 until 9 o'clock. We understand the instruction is given free of charge, all the pupil has to provide being the necessary materials and instruments for use in the classes. This school, in connection with the Ohio Mechanics' Institute, is comparatively little known, but from what we have heard it deserves a far wider publicity. The work done in the past has been most excellent, and the school offers many facilities for

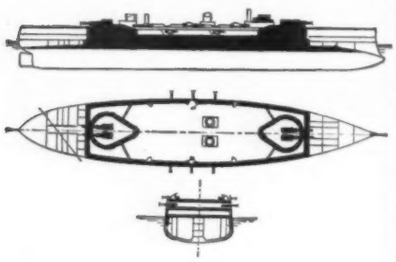


Fig. 2.—New Barbette Ship.—Design.

instruction for persons residing in the neighborhood of Cincinnati. For the benefit of those who may care to learn further about this institute we will state that the secretary is William H. Stewart, 305 Plum street, Cincinnati, Ohio.

Designs for New English Battle-Ships.

The first paper read at the late meetings of the Institution of Naval Architects of Great Britain was "On the Designs for the New Battle-Ships," by

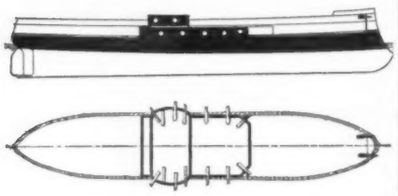
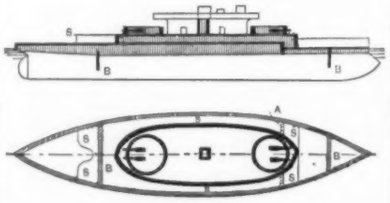


Fig. 3.—Sultan.

W. H. White, F.R.S., Assistant Controller of the Navy and Director of Naval Construction. The paper, which we condense below, describes the main features of the approved designs for the eight first-class battle-ships which are proposed to be added to the navy, and contrasts their protection, armament, speed and coal endurance with the corresponding features of other battle-ships designed during the last 20 years. The information presented may be considered accurate and authoritative, as the author obtained permission from the First Lord of the Admiralty to prepare the paper.

Two designs have been prepared and approved by the Board of Admiralty, and in both are embodied identical qualities, so far as relates to the disposition (in plan) of the armament; the number and caliber of the heavy guns; the nature, disposition and protection of the auxiliary armament; the distribution and thickness of the hull armor; the propelling machinery, speed and coal supply; the complement and equipment; magazines and transport of ammunition, and arrangement for hold stowage. In principal dimensions and displacement the two types are identical. The essential differences



A is bulkhead from breastwork to ship's side.
B B are bulkheads added during construction.
S S is superstructure added during construction.

Fig. 4.—Devastation.

are that while one design is for a turret ship with moderate free-board at the extremities, and with guns about 17 feet above water, the other is for a barbette ship with the guns carried about 6 feet higher, and with high free-board at the bow and stern.

The board took into consideration all the principal dispositions of armament adopted in recent years for battle-ships, as well as several proposals that have been made—some of which have been patented—but not yet carried out in practice. It may be of interest and assistance in the discussion if I briefly summarize and illustrate some of the more important of these arrangements, and for this purpose a series of dia-

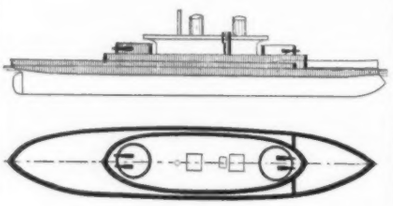


Fig. 5.—Fury.

grams—Figs. 3 to 16—have been prepared. On these diagrams the arrangement of the armor is also indicated. Fig. 3 shows the disposition of the armament of the Sultan, designed in 1868. Practically the whole of the armament is contained in a central two-storied battery placed amidships, and associated with a water-line belt of armor. Other illustrations of the "belt and battery system" need not be given, as it is well known. Figs. 4 and 5 show respectively the arrangements carried out in the "breastwork monitors" Devastation and Thunderer, designed in 1869 and proposed for the Fury in 1870. Here a low free-board is adopted for the greater part of the length; and the two turrets, each containing two guns, are placed at the ends of the armored breastwork, which is of less breadth than the ship. This design for the Fury was canceled, and work upon the ship stopped at an early stage. The vessel was entirely re-designed in 1872—see Mr. Barnaby's paper in *Transactions* for 1873—and became the Dreadnaught, which is illustrated in Fig. 6. In all these designs the disposition of the armament is identical, and in securing the "all-around fire" of the turret guns it was made practically impossible to carry any effective secondary armament. Fig. 7

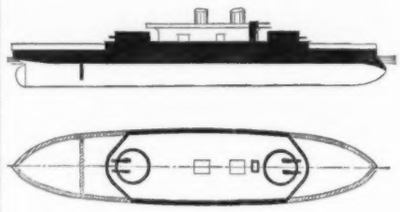


Fig. 6.—Dreadnaught.

shows the Inflexible, a central citadel ship, with turrets placed *en échelon*. In some of the later ships of this type an endeavor has been made to carry a few 6-inch guns as well as light quick-firers on the superstructures; but, as in the previous disposition, the means taken to secure large arcs of command for the heavy guns reduced greatly the efficiency of the secondary armament. Fig. 8 illustrates the arrangements of the Italian citadel-turret ships Duilio and Dandolo, and Fig. 9 those of the German citadel-barbette ships of the Sachsen class. During the period 1869–78 very little was done in the designs of H. M. ships in the direction of providing for a numerous and effective secondary armament, but this was not true in foreign

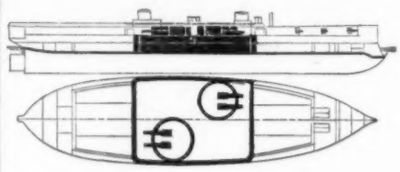


Fig. 7.—Inflexible.

navies, and particularly in the French Navy. Figs. 10 and 11 show the principal features in the disposition of armament in a large proportion of the French battle-ships. There are four protected stations, each containing a heavy gun with a large arc of training. At a lower level are placed a number of guns of moderate caliber, sheltered to some extent from the fire of the heavy guns. A very similar arrangement to Fig. 11 has been adopted in the Imperieuse and Warspite of the Royal Navy, where considerable experience has been gained of its practical working. Another typical disposition of the armament is illustrated by Fig. 12, which represents broadly the arrangements adopted in the Italian battle-ships Italia and Lepanto. Here

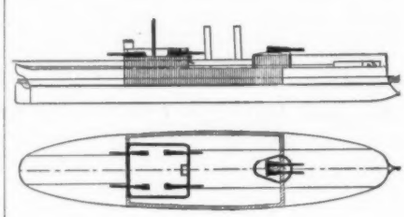


Fig. 8.—Sachsen Class.

the four heavy guns are carried *en barbette*, high above the water, at the ends of a single armored inclosure placed near the middle of the length of the ship; nearly the whole upper deck forming a glacis, over which these guns fire if the full arcs of training are obtained. The auxiliary ar-

mament is chiefly carried on the main deck, and sheltered by the upper deck from the fire of the heavy guns. It will be remembered that in the design for an American battle-ship, described by Mr. John in a paper read before the institution last year, a somewhat similar disposition of the armored battery or citadel was adopted,

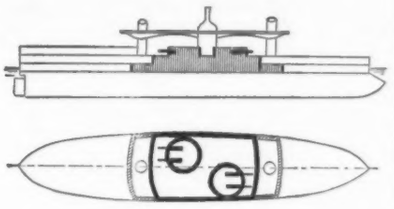


Fig. 9.—Duilio and Dandolo.

but in association with turrets, and with a different arrangement of the auxiliary armament and upper works. Fig. 13 represents the Russian battle ship Catherine II. In this case the battery is of large extent, and at each end of the corners pairs of heavy guns are mounted *en barbette* on the disappearing principle. The upper deck is a glacis for their fire, and the auxiliary armament is placed below this deck. Fig. 14 represents the disposition

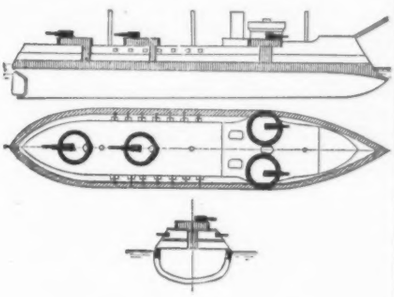


Fig. 10.—Admiral Duperre.

of armament in the Admiral class. Here the secondary armament is greatly developed and mainly carried in a central battery between the two protected stations containing the four heavy guns. Fig. 15 illustrates the very similar arrangements—in plan—adopted in the Nile and Trafalgar. It will be seen that in these vessels the central battery is shorter, and the secondary armament less numerous than in the Admirals. Fig. 16 illustrates one

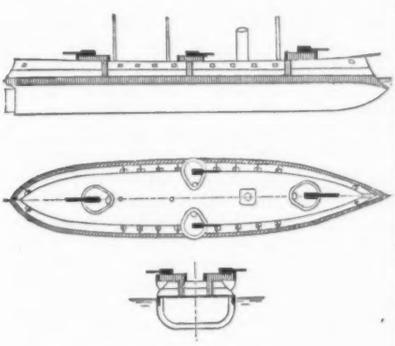


Fig. 11.—Magenta Class.

of the various arrangements proposed by Sir Edward Reed, but not adopted, I believe, in any ship yet built. . . .

After careful consideration of these and other alternative arrangements the board laid down the following principles for the new designs: 1. That there should be four heavy guns placed in two protected stations, situated at a considerable distance apart, each pair of guns having an arc of training of about 260°, equally divided on each side of the line of keel. All four of these guns to be available on each broadside. 2. That the greater portion of the auxiliary—or secondary—armament should be placed in a long, central battery, situated between the two heavy-gun stations, and so disposed that there should be practically no interference with the fire of any one gun by that of any another. 3. That in view of the development of high explosives, it was desirable to secure the widest possible distribution of the guns in the auxiliary armament, and that it was preferable to mount the auxiliary armament on two decks, one of them being the spar deck, rather than to carry the guns chiefly between decks. It has been decided that each ship shall carry four 13½-inch 67-ton guns as the principal armament, with

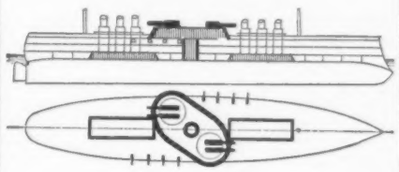


Fig. 12.—Italia and Lepanto.

hydraulic apparatus for training, elevating and loading the guns. The grounds for this decision are stated as follows: The hight of the turret guns above water in the Trafalgar as designed was 15 feet; in the new turret ship it will be 17 feet. With the thick armor used for the protection of turrets and turret bases this apparently small change in the hight of the guns above water involves an additional weight exceeding 150 guns. In the barbette ships the heavy guns will be 23 feet above water.

While the heavy-gun armament is practically identical with that of preceding ships, the auxiliary armament is of un-

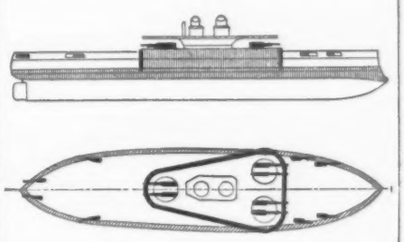


Fig. 13.—Sinope Class.

precedented weight and power. The new battle-ships are each to carry ten 6 inch 100-pounders, besides a considerable number of smaller quick-firers. The 6-inch quick-firing gun is still in the experimental stage; it will be adopted in these ships if successfully worked out, and weight has been taken for it. So far as weights are concerned, these ten 6-inch guns, with their mountings and ammunition, represent no less than 20 guns of the same caliber with the allowance of ammunition hitherto carried. The total weight of the auxiliary armament in the new ships is about 500 tons, or considerably over three times the weight originally assigned to the corresponding armament in the Trafalgar, and two and two-third times as great as the weight of the auxiliary armament to be actually carried by that ship. The weight of the auxiliary armament in the new battle-ships is practically equal to the total weight of armament proposed for the Fury design in 1870, the latter ship being of nearly 10,500 tons displacement.

The armor protection of the hull proper includes two principal features: 1. A belt 8½ feet broad extending over two-thirds the length of the vessel, and having a maximum thickness of 18-inch armor. Transverse armored bulkheads complete the belt; a 3-inch steel deck is fitted above it, and a strong protective under-water deck completes the protection before and abaft the belt. 2. The broadside above

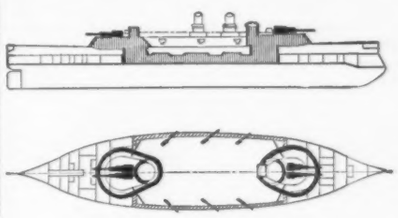


Fig. 14.—Collingwood.

the thick belt is protected to a hight of about 9½ feet above water over a considerable portion of the length by 5-inch armor. Screen bulkheads, similarly armored, inclose the central battery. The protection of the heavy guns consists of 18-inch armor on the turrets, and 17 inches on the redoubts protecting the turret bases, &c. The illustrations in Fig. 1 will make this description clearer. It will be seen that each turret stands in a separate battery or redoubt, which rests upon the protective deck, and is strongly armored for the de-

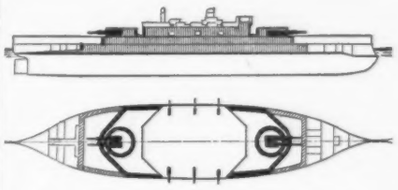


Fig. 15.—Nile and Trafalgar.

fense of the turret bases and loading apparatus. This system has been previously carried out in the Victoria and Sans Pareil, in each of which there is only one turret. The belt armor rises 3 feet above water and extends 5½ feet below water. Its longitudinal extent is sufficient to insure that if the spaces before and abaft it and above the under-water protective deck were flooded very small "sinkage" and very moderate "change of trim" would ensue. The maximum thickness of the belt armor is 18 inches, as against a maximum of 20 inches in the Trafalgar; the minimum thickness at the ends of the belt is the same as in the Trafalgar—14 inches. The proportion of the length protected by the belt is

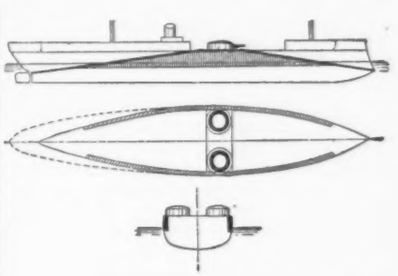


Fig. 16.—Sir E. J. Reed's Design.

the same in both cases. Above this thick armor belt and protective deck the broadside is armored with 5-inch steel for a length of 145 feet, and to the hight of the upper deck amidships (9½ feet above water). Oblique armored bulkheads or screens extend across the protective deck and meet the redoubt armor, thus com-

pletely inclosing a ligh armored citadel with its top at the level of the upper deck (9½ feet above water), having the same extreme length as the central battery, viz., 170 feet. Within the 5-inch steel armor on the sides coal bunkers are built, extending from the belt to the upper deck, and having an athwartship thickness of 10½ feet. When filled with coal these bunkers would greatly re-enforce the defense; when empty, the minimum defense is 5 inches of steel, which is proof against all the smaller kinds of quick-firing guns and against many of the most destructive forms of attack from much larger guns. In the Trafalgar the two "turrets stand at the ends of a long armored citadel extending to the full breadth of the ship, with vertical armor on the sides (varying in thickness from 16 inches to 18 inches) rising to a hight of about 11 feet above water," according to the original design. In the completed ship this hight will be about 10 feet. The upper deck over the citadel is plated with 3-inch steel. The distance between the centers of the two turrets is about 150 feet, and the central battery between the two turrets has an extreme length of less than 110 feet and a length along the broadside of about 65 feet. In the new turret ship it has been necessary to provide a much longer central battery (about 170 feet in extreme length) to accommodate the more numerous and powerful guns in the auxiliary armament; and the turrets are placed about 200 feet apart. Consequently, if the citadel system embodied in the Trafalgar had been repeated the length of the thickly-armored sides would necessarily have been considerably increased; and a great additional weight and cost of armor, &c., would have been incurred if the same thickness had been maintained, or a considerable thinning of the armor, &c., made necessary if the same total weight had been adhered to. No point in the new designs received more careful consideration than this. In order to elucidate the matter, alternative designs were prepared for ships of the same displacement, identical in all respects except as regards the adoption of the "citadel" or the "separated redoubt" systems. With separate redoubts, placed far apart, the two stations are isolated, and there is practically no risk of simultaneous disablement by the explosion of shells or perforation of projectiles from the heaviest guns. Each redoubt offers a small target to the fire of an enemy, and its weakest part—the thick steel protective plating on the top—is of so small extent that the chance of its being struck is extremely remote. Serious damage to the unarmored turret bases, therefore, involves the perforation of the thick vertical armor on the redoubts.

With a single citadel extending the full breadth of a ship the case is widely different. Over a comparatively large area of the protective deck plating in the neighborhood of each turret perforation of the deck or its disruption by shell explosions at any point involves very serious risk of damage to the turret bases and the loading apparatus. In fact, such damage may be effected and the heavy guns put out of action while the thick vertical armor on the citadel is uninjured. Moreover, as the turrets stand at the ends of a single citadel, there is a possibility of their simultaneous disablement by the explosion of heavy shells within the citadel. This last risk may be minimized (as in the Nile and Trafalgar) by constructing armored "traverses" within the citadel, but it cannot be wholly overcome so long as both turrets stand in one armored inclosure. It may be thought that the risk of damage to a 3-inch steel deck situated 11 feet above water is remote; but I think the facts are as stated, when actions at sea are taken into account. For example, if a ship of 70 feet to 75 feet beam is rolling only to 10° from the vertical, which is by no means a heavy roll, she presents a target having a vertical (projected) hight of 13 feet to 14 feet to an enemy's fire, and even if she is a steady, slow-moving ship she will do this four or five times in each minute. Now, at this angle of inclination, assuming the flight of projectiles to be practically horizontal, even the thickest protective steel decks yet fitted in battle-ships are liable to serious damage from the fire of guns of moderate caliber, and this danger is increased by the employment of high explosives. Of course I do not mean to say that this damage is to follow from fire intentionally aimed at the protective deck; but with a great and sustained volume of fire, such as is possible with a powerful auxiliary armament, and especially with quick-firing guns, it is obvious that there is a very real danger of chance shots injuring seriously the wide expanse of the protective deck at the top of a long citadel. Again, it must be noted that the chances of damage to a deck placed 10 feet or 11 feet above water, and with large exposed surfaces in the neighborhood of the turrets when a ship is inclined or rolling, are greater far than those of a deck 7 feet or 8 feet lower, and with 5-inch armor on the sides protecting the deck from the direct impact of shells containing heavy bursters. It is for the naval gunners to estimate these chances of injury; but, unless I am greatly mistaken, their verdict will be that a far greater number of shots are likely to strike at a hight of 8 feet to 10 feet above water than at a hight of 4 feet to 5 feet.

I will now proceed to summarize the chief points of difference between the designs—see Figs. 1 and 2. In the barbette ships the free-board at the ends is increased to 18 feet, or 6½ feet more than the free-board in the turret ship, and about 7 feet 4 inches more than in the Trafalgar as completed. The heavy guns are carried 23 feet above water, as against 17 feet in the new turret ship, and about 15 feet as designed, or 14 feet as completed, in the Trafalgar. In the Royal Navy a very large proportion of our most recent and powerful ships are of moderate free-board, carrying their guns only 12 to 14 feet above water, whereas in foreign navies, in recent years, the heavy guns are chiefly carried from 22 to 28 feet above water, and the free-board is high The decision of the admiralty to largely adopt the barbette design is avowedly based on these facts and arrived at with a full knowledge of the relative advantages and disadvantages of the turret and barbette systems, after considering designs for turret ships with guns placed at equal hight above water, and with the same free-board as the barbette ship. It will be obvious that the increase in hight of free-board and of guns above the water can only be secured by means of additional hull weights and rearrangements of the armor. What has been done is this: The turrets have been abolished, and the weight of armor, &c., is utilized in adding to the hight of the redoubts in which the turret bases stand. The barbettes thus formed are strongly armored from the 3-inch protective deck above the belt upward, and are divided into two stories. In the upper story stand the turn-tables carrying the heavy guns; in the lower story will be placed the turning engines and other important portions of the equipment. The hydraulic system of mounting, working and loading the 67-ton barbette guns to be carried out in the new ships will resemble closely that already successfully adopted in the Admiral class. As regards the disposition of the belt armor, protective deck and 5-inch armor, as well as the protection of the auxiliary armaments, the barbette ships are identical with the turret design, already described.

It was originally contemplated to adhere in the new designs to the speed that had been first accepted for the Trafalgar—viz., 15 knots on the measured mile with natural draft and 16¾ knots with forced draft. In working out the designs it has been found possible to increase these speeds to about 16 knots natural draft and 17½ knots with forced draft.

It was decided, after full consideration, that the new ships should ordinarily carry 900 tons of coal, as in the Trafalgar, and be capable of covering the same distance—viz., about 5000 knots at 10 knots. Like the Trafalgar, the new ships will have a bunker capacity sufficient to carry a much larger quantity of coal if desired. But whereas any increase above 900 tons in the coal put on board the Trafalgar necessitates an increased draft and some loss of speed, in the new designs provision is made—in the form of the so-called "board margin"—for an unappropriated weight exceeding 500 tons to be carried at the designed load draft and at the full speed. Strictly speaking, therefore, the case stands thus: Trafalgar, coal at load draft, 900 tons; new designs, coal at load draft and unappropriated weight, about 1400 tons. If the unappropriated weight should be assigned to coal it would give the new designs a coal endurance of nearly 8000 knots at 10 knots. Apart from any such increase in coal, however, the 900 tons proposed is a very large supply in relation to expenditure; larger, in fact, than that of nearly all first-class battle-ships. Take, for example, the Thunderer and Devastation as completed. They can cover about 4700 knots at 10 knots. Their full speed for continuous steaming in smooth water is estimated at 12½ knots, and they can cover about 2700 knots. At that speed with 900 tons of coal the new ships could cover about 3500 knots. At the highest speed contemplated for smooth water, continuous steaming—about 16 knots—the new ships could cover about 1900 knots. The forced-draft speed is never intended to be maintained for more than four to five hours continuously, so that an estimate of coal endurance under these conditions is worthless for any practical purpose.

	Length.	Mean draft.	Displacement.	Maximum speed.
	ft. in.	ft. in.	Tons.	Knots per hour
New ships, excluding bo'rd margin.	380 0	26 8	13,600	17½
Trafalgar, as designed.....	345 0	27 6	12,000	16½
Inflexible.....	320 0	25 3	11,880	13.8
Dreadnaught..	320 0	26 9	10,820	14.2
Minotaur.....	400 0	26 9	10,690	14.4
Warrior.....	380 0	26 9	9,210	14.1
		Extreme draft.		
Italia.....	400 6	31 3	13,900	18
Lepanto.....	400 6	30 9	13,550	18
Sicilia.....	400 0	28 6	13,253	18
Admiral Baudin.....	321 6	26 2	11,380	15

Before sitting down I will add two or three statements which appear to be of some importance when dealing with the relatively large size of the new ships. First, they have been shown to be made large by the great loads of armament equipment and board margin they carry on a moderate draft at high speed. Omitting the board margin—or allowance for contingent additions during construction—the ships are of 13,600 tons displacement and about 26 feet 8 inches mean load draft. I am not at liberty to make any statement respecting the admiralty estimate of cost for these ships, for reasons which will be obvious. But this I may say, that while the total weight of protective material in the new ships is greater than the corresponding total in the Trafalgar by something like 150 tons, the adoption of the 5-inch armor in association with redoubts, instead of a

central citadel thickly armored throughout, has the result of largely reducing the cost of the armor. This was not the reason, however, for the adoption of the system, as has already been explained. At the next meeting of the institution this question of cost may be debated on the basis of ascertained figures, and I therefore say no more.

THE WEEK.

In 1886 there were three cities in Kansas with a population exceeding 15,000 each. At this time there are six cities varying in population from 15,000 to 50,000. In 1886 there were but 55 towns and cities exceeding in population 1000 At this time there are 107 cities and towns with a population of 1000 each.

Relative to steamship traffic between British Columbia and American Pacific ports, Captain Goodall, of San Francisco, agent of the Pacific Coast Steamship Company, states before the United States Senate Committee to Investigate Trade Relations with Canada that of the shipments north from San Francisco about 10 per cent. goes east by the Canadian Pacific, and about the same amount by the Northern Pacific. In his opinion the subsidized steamer lines of the Dominion Government will in time prove fatal to American lines unaided by the Government. British vessels cost fully 25 per cent. less to run than American vessels

Secretary Tracy awarded to the Richmond Locomotive and Machine Works the contract for supplying the boilers and machinery of the battle-ship Texas, now building at the Norfolk Navy Yard. The price fixed in the contract is $634,500. The Richmond bidders were in competition with some of the largest and oldest engineering works in New York, Philadelphia and Baltimore, and the contract was awarded to them after a careful inquiry which satisfied the Department of their ability to undertake a work of this magnitude. This action is in accordance with the Department's policy of enlarging the number of private establishments capable of building vessels and machinery, as well as of locating them in different sections of the country.

The introduction of flax culture on lands where wheat has ceased to be profitable is strenuously advocated by the Agricultural Department at Washington.

A new gas company with a capital of $800,000 is forming in Pittsburgh to run a pipe line to the Bellevernon gas fields, for the supply of Oliver Brothers & Phillips' South Side Mills, the Republic Iron Works and Oliver & Roberts' Wire Mills.

In sinking a well for Spreckels' refinery at Philadelphia a copious flow of gas has been struck which Mr. Spreckels says will be worth $2000 a day if the supply is sufficient.

An unseemly strife for the possession and occupancy of piers in New York City is renewed from year to year in the absence of specific laws relating thereto. The effort now is on the part of railroad corporations as against ship-owners in the China trade and others who have long occupied piers on the East River, to whom deep water alongside the wharves is indispensable. The shippers claim that enough short piers could be built below Grand street to accommodate the railroad companies, which only use shallow transports, without encroaching on their ancient prerogatives.

The Assembly ceiling scandal is followed by the report of an investigating committee, which states that there was a profit in the work of $120,000, of which $39,086.91 still remains in the Treasury. This leaves $80,000 in the hands of Snaith and Sullivan, the contractors. Investments aggregating $26,000 being admitted by Sullivan and $28,089.28 by Snaith, leaves to be accounted for only $26,000, which the committee are satisfied was not disbursed on account of legitimate expenditures on the Capitol building.

The transcontinental mails between New York and the Pacific Coast are being transported in about 22 hours faster time than heretofore.

The Turkish Government is asked to consent to the invasion of Palestine by a locomotive railway, from the Mediterranean to Damascus, with the right of navigating Lake Galilee. The whole distance is 105 miles. "Fifteen minutes' stop at Jerusalem for refreshments!"

The Hamburg steamship Rugia, outward bound from this port with a cargo of cotton and lard, narrowly escaped destruction from fire, but was saved by forcing steam into the hold after the use of water seemed to be unavailing.

Throughout Florida the season has been several weeks behind the average, while at the North the spring has come early, and in the grain-growing regions far West the reversal of ordinary conditions is quite as noticeable as anywhere else.

Boston papers pronounce as ridiculous the attempt to boom the rubber market, intimating that it is only a device of speculators to get rid of their holdings, carried at a considerable loss.

The Government of Trinidad offers a subsidy of $25,000 per annum for the establishment of a semi-monthly line of mail and fruit steamers between New York and Port of Spain.

General Brust, of Colorada, has purchased for a cattle company 140,000 acres from the Cherokee Nation for $5000.

Minnesota millers say the recent rains in Dakota and Minnesota would have been cheap at $1,000,000.

The New York Central Railroad Company propose to rebuild their grain elevator recently burned in this city.

In West Virginia, between Fairmont and Clarksburg, there are veins of coking-coal 6 feet thick. A railway connection will be made direct to Pittsburgh.

In consequence of the strike of about 70,000 German coal-miners many iron furnaces have been compelled to extinguish their fires. The Krupp Works have arranged to obtain coal from Upper Silesia and England and will resume the making of rails.

Caleb W. Mitchell has received from the Mexican Government a concession of land in several Northern States, permitting the establishment of several industrial and agricultural colonies, at the same time guaranteeing a bonus of 10 per cent. on the capital invested. The privileges include the erection of factories and workshops.

Surveys are making for a railroad from Pierre, Dak., to Puget Sound under the auspices of the Illinois Central, with the object of controlling the cattle trade. The line will run through the Sioux Reservation and the Yellowstone.

The directors of the Exposition Society of Pittsburgh awarded the contract for the erection of Machinery Hall to the Marshall Foundry and Construction Company for $130,000, to be completed by September 1. The contractors for the main building are Murphy & Hamilton.

American trade relations with China are briefly touched upon in the annual review issued by the New York Chamber of Commerce. For nearly 100 years New York merchants have had friendly intercourse with those of China, but there has been a change of late, and a feeling of alienation has gradually arisen. The report says the question of Chinese registration is delicate in many respects, but there is reason to hope that it will be finally solved in accord with the liberal spirit which the American Government has usually manifested in its dealings with foreign nations. If not, we must not be surprised to see this once profitable commerce pass from American and from British hands also into that of the German, with whom there cannot arise any such race conflict as the immigration of the Mongolian race has caused on the Pacific slope of the American continent.

The Illinois State Commissioners appointed to consider the expediency of manufacturing twine in the State prison estimate the consumption of twine in the State annually to exceed 4000 tons, costing about $150,000 delivered.

Judge Barrett, of the Supreme Court, has decreed the dissolution of the bogus sugar-refining company and the forfeiture of its franchises.

The American Meat Company, of which Warner Miller is president, expect to supply New York and other Eastern markets with beef raised in New Mexico and slaughtered in Kansas City, in competition with beef from Chicago.

Ten beet-sugar factories to be erected in California will be supplied with machinery from workshops in that State, except a few pieces from Germany. The expenses of each factory will amount to at least $100,000 a month, or a total of $1,000,000 for the ten factories at the lowest calculations, exclusive of what they will have to pay to farmers for beets. The factories will produce 50,000 tons of sugar annually, which means the production of 500,000 tons of beets in that State.

Five large breweries, of which three are in Newark, one in this city and one in Albany, have been consolidated under a single management, with an aggregate capital of about $5,000,000, to be represented by an issue of stock.

Charles George Wilson, the newly appointed Commissioner of Public Works, is the subject of much unenviable criticism by the newspaper press.

The residence of the late Joseph Sheffield, of New Haven, is about to pass into the possession of the Sheffield Scientific School.

With reference to numerous expected consular appointments by President Harrison, word comes from Washington that they will not be made hastily. The President, it is stated, is going to make personal investigation into the fitness of applicants for consular offices, in accordance with the policy which he outlined some time ago of reorganizing the service. It will be the policy of the President to put in consular offices men who can be of commercial advantage to their country abroad.

The new recitation hall for Yale College, now approaching completion, is architecturally the pride of New Haven. Fourteen huge Scotch granite columns adorn the entrance. The entire cost will be $200,000, but who the benefactor is remains a mystery.

Thomas A. Edison brings suit to recover $250,000, which in some way disappeared in a phonograph transaction, and which he claims to have lost. The defendants are E. T. Gilliland and John C. Tomlinson.

Ex-Consul Smith, of Carthagena, says that the Republic of Colombia presents a vast field for American enterprise. Electric

lights, water-works, railways and ice machines are particularly wanted now, and the Government is liberally disposed.

The Brooklyn Bridge trustees voted to expend $409,000 in extending and otherwise improving the New York terminal. The cost of changing the platform will be $150,000.

A Rio paper says there is no doubt that the Brazilian Government, as an ally of Paraguay, is preparing to protect her against a threatened invasion by Bolivia, and that the cost may be very high.

It is estimated that 100,000 persons will go abroad this season, and if each individual takes but $1000 the total will reach $100,000,000, a sum large enough to have an important effect on our trade balances with foreign countries.

The Supreme Court at Washington, on Monday, affirmed the validity of the law excluding Chinese laborers known as the Scott Exclusion act. The case in which the decision was made is that of Chac Chang Ping, who left this country with a certificate entitling him to return, before the passage of the act. He has since attempted to land at San Francisco, and was refused admittance. The Supreme Court holds that Congress has the power to abrogate a treaty, and in support of that view cites the authorities of the courts on the subject, holding that the propriety of such action is not a matter for judicial cognizance, but that it is a matter for the political department. Congress, it says, has the power to exclude aliens from the country whose presence is deemed inimical to our interests.

Our Consul at Neuvo Laredo, Mexico, reports to the Department of State that the bridge across the Rio Grande, connecting Neuvo Laredo, Mexico, and Laredo, Tex., was completed on the 6th inst. and will greatly facilitate commerce between the United States and Mexico, and result in reduced rates of transportation.

The Spanish Exhibition will open on May 30.

It now appears probable that nearly all the governments invited to participate in the Congress of American Nations at Washington next autumn will be represented. The question of steamship subsidies is likely to be among the leading topics discussed.

It is announced that the Canadian Pacific road across Maine is practically completed, and will be opened late in June ready for business from British Columbia across the continent, and to Europe from Halifax.

Forty-seven hundred tons of sugar, valued at $470,000, arrived at Boston 12th inst., brought by the steamship Shawmut, with a cargo of 12,700 bags, and the barge Atlas, with 16,000 bags, the latter taken in tow, from Matanzas, Cuba. The voyage was made in 11 days, and the two captains by whom this feat was accomplished claim that long-distance towing is practicable if suitable vessels are used.

New York State is now prepared to kill murderers by the use of machinery, the Superintendent of State Prisons, Austin Lathrop, having bought three dynamos, which will be distributed between Auburn, Sing Sing and Clinton prisons, each capable of making corpses of healthy men in a period of less than seven seconds. They cost the State $8000.

Cramp & Sons have received a $350,000 contract for the construction of a steel steamship for the Metropolitan Steamship Company, of New York. The new craft will be 271½ feet long, 43 feet beam and 19½ feet depth of hold, registering 2625 gross tons.

MANUFACTURING.

Iron and Steel.

Soho Furnace, of the Moorehead-McCleane Company, produced 5520 gross tons of pig-iron during the month of April.

The two blast furnaces of Schoenberger, Speer & Co., of Pittsburgh, produced 5354 gross tons of Bessemer pig-iron during the month of April last.

The nailers in the employ of Chess, Cook & Co., Jones & Laughlin, Limited, and Schoenberger & Co., nail manufacturers, of Pittsburgh, have received notice that if the scale of wages for cutting nails recently put in operation at the Bellaire Nail Works, of Bellaire, Ohio, is adopted in the Ohio Valley district the Pittsburgh nailers must also accept the reduction or the machines will be stopped entirely. Out of about 200 nail machines in Pittsburgh only about 75 are being operated, and these only about half time. It is believed that the nailers will agree to accept the reduction, with the expectation that by doing so they will have steadier employment. The scale now in force at Bellaire is a reduction of 35 per cent. on 5d nails and sizes below, and 12½ per cent. on all sizes above 5d. It is the heaviest reduction made for nail-cutting since the long strike of 1882.

The charcoal furnace of the South Mountain Mining and Iron Company, at Pine Grove Furnace, Cumberland County, Pa., was blown out on February 23 in order that improvements in the plant might be made. Since that date the stack has been relined from bottom to top, the hot oven has been renewed and general repairs have been made. The furnace was successfully blown in again on April 20 and 21. It has continued running well, and its capacity is found to have been increased 25 per cent. With these advantages and thorough cleaning of the ore the company expect to reduce the cost of making pig-iron. Mr. S. R. Still is now the superintendent of the furnace.

Some extensive improvements have just been completed at the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., by which the capacity of the rail mill has been increased to nine finished rails per minute. The rolls of the blooming mill have been enlarged, and now 1½-ton ingots are made into two blooms, each of which makes three rails. Another saw has been added also, and now three rails can be sawed, instead of two, as before.

The nail factory of the Belmont Nail Company, at Wheeling, W. Va., resumed operations last week, the nailers agreeing to accept the Bellaire scale for cutting.

The blast-furnace of the Bellaire Nail Works, at Bellaire, Ohio, has now been in blast for two years and seven months on its present lining, and during that time has made 123,000 tons of pig-iron, 95 per cent. of which was No. 1 Bessemer. From present appearances the furnace will continue in blast for some months to come.

The 24-inch mill of the National Tube Works Company, at McKeesport, Pa., was put in operation last week to fill a large contract for 8-inch pipe. It has been idle for some time.

The coke blast-furnace of the Paducah Iron Company, at Paducah, Ky., is to be put in blast during the summer. This furnace formerly belonged to the Nova Scotia Iron Company, of St. Louis, and ran on charcoal. It was removed from Salem, Mo., to Paducah in 1888.

On the 7th inst. work was resumed in the pipe mill of the Reading Iron Works at Reading, Pa., to finish 1000 tons of pipe that had been commenced before the firm suspended. This work will occupy three weeks. The two large blast-furnaces of the works, which have been in operation since the failure, were ordered to go out permanently last week. The assignee will in a few days begin to dispose of the property.

The Bouton Foundry Company, of Chicago, have for some time been engaged in removing their buildings from the old location on Archer avenue to a tract of land which they have secured at Thirty-ninth and Winter streets. In re-erecting the plant a number of improvements have been made, and the owners believe that they will have one of the most conveniently-arranged and perfectly-equipped foundries in the West. They will have an abundance of room for enlarging the plant if that should become necessary. The machine-shop is now partly in operation, and the foundry will probably begin to melt iron this week.

The Pioneer charcoal furnace of the Iron Cliff Company, at Negaunee, Mich., has been doing remarkably good work. The furnace has made thus far on this blast 52,000 tons of pig-iron, and during the last month it averaged over 80 tons daily. The highest product for any one day was 89 tons, which was accomplished on the 30th of April. As the dimensions of this furnace are but 57 feet by 10 feet, it is claimed that this is the best record for a charcoal furnace up to this time. The large output is certainly very creditable to the management, and sustains the reputation which charcoal furnacemen are now making for progressiveness.

The Wellston Furnace Company, of Wellston, Ohio, exhibit in the office of Forsyth, Hyde & Co., at Chicago, a sample of their No. 1 foundry pig-iron cast in the form of a carving knife and ground to quite a sharp edge. The iron is remarkably close grained and shows up well in a test of this character.

The South Halsted Street Iron Works, at Twenty-sixth and Halsted streets, Chicago, are quite busy at present on architectural work. Last week the foundry turned out some of the heaviest columns which have been cast in Chicago. They are 28 inches square, weigh 7½ tons each, and were cast in two lengths, one part weighing 4 tons and the other 3½ tons. These columns are to be used in a very substantial building now being erected for manufacturing purposes in Chicago. The company have contracts for the architectural iron work on quite a number of buildings now in course of erection in Chicago, as well as a large office building and the Masonic Temple in Denver, Col.

Furnace A, of Carnegie Bros. & Co., Limited, at Braddock, Pa., was blown out on the 11th inst., for relining and other repairs. It will be ready for blast again about July 1, next.

A press dispatch from Green Brier, W Va., under date of the 12th inst., says: "The Glenmore Iron Company, organized with Gen. J. R. Anderson, of the Tredegar Iron Works, Richmond, as president, will erect a great plant on the Glenmore estate, 3 miles from this place. They have acquired 3000 acres of land, upon which there is a vein of iron ore 40 to 60 feet thick and 6 miles long, which can be mined by open cutting. The Chesapeake and Ohio Railroad will run a branch line to the mines and works."

Wm. B. Scaife & Sons and the Scaife Foundry and Machine Company, Limited, of Pittsburgh, have about completed the greater portion of a new Bessemer plant, with a number of new improvements, for Messrs. Miller, Metcalf & Parkin. The buildings, all of iron frame-work, covered

with corrugated iron, were designed and erected by the first-named firm, and the various styles of cranes, ladles, converters and hydraulic machinery were designed and built by the latter.

Machinery.

The Mahoning Boiler Works of W. B. Pollock & Co., at Youngstown, Ohio, are in full operation, with plenty of orders on hand. This is one of the oldest industries in Youngstown, having been established more than 25 years ago.

The Metcalfe Company have recently been organized at Shippensburg, Pa., with a capital stock of $150,000, for the manufacture and sale of machinery.

J. A. & S. F. Dunkle, of Steelton, Pa., and J. B. Ewing, of Harrisburg, Pa., have recently purchased the entire plant and good-will of the Star Steam Heater Company, of Mount Joy, Pa., including the exclusive control of the patents. Large and commodious shops will at once be built at East End, Harrisburg, according to new plans especially adapted for their business. Three departments—viz., boiler-making, machine shop and foundry—will be fully fitted out with the best machinery. It is expected that the shops will be completed some time during July, when they will immediately be occupied. Meanwhile operations have begun in the old shops in Mount Joy, where work is being pushed to its utmost to supply the demand. The address of the firm is Star Steam Heater Company, Harrisburg, or until after August 1, Mount Joy, Pa. H. H. Lindemuth, the patentee, has connected himself with the new firm and will give the boilers his personal supervision.

The Buffalo (N. Y.) Forge Company have issued a catalogue on heating, drying, ventilating and cooling, which not only shows the fans and blowers made by them, but also shows the machines applied to various uses. The construction and operation of their hot-blast apparatus is also described and illustrated, and its application to the warming of factories of different designs and to lumber dry-kilns is shown. The ventilating arrangements by means of their exhaust disk-wheels are illustrated in the case of schoolhouses, foundries, machine and blacksmith shops, &c.

A catalogue recently issued by the Buffalo (N. Y.) Steam Pump Company fully illustrates the many and various styles of pumps made by this firm. From the catalogue a clear idea may be formed of the construction and operation of each of the pumps and the work they are designed to perform. The last few pages of the book are devoted to useful information regarding hydraulics, steam-engines, wrought and cast iron pipe, watering-pipes, &c.

The Canton Steam Pump Company, of Canton, Ohio, have recently issued an illustrated catalogue and revised price-list of the Miller duplex steam pump and the Torrent and Unique steam pumps for boiler-feeding, brewing, mining and general purposes. The sectional views accompanying the engravings clearly show the construction and operation of the pumps and their most important features.

Hardware.

William Neil & Co., manufacturers of oil tanks for the use of grocers and others, have removed to Nos. 11 and 13 Dearborn street, Chicago, where they will have increased facilities and will be fully prepared to meet promptly the demands of their customers.

Hubbard & Co., of Pittsburgh, have expressed themselves to the effect that they would rebuild their axle factory, destroyed in that city a few weeks ago, in Beaver Falls, Pa., on the same grounds and adjoining their branch works at that place, provided they could get ground enough. The council has passed a resolution grading a 60-foot street between the branch works and the Western File Works. This will give them ample room, and it is thought will induce them to locate there.

The Youngstown Stamping Company, of Youngstown, Ohio, manufacturers of stamped and japanned ware, report business to be in a very satisfactory condition. One of the articles manufactured by the firm is a glass fruit jar with a patent cover, which is said to be meeting with an excellent sale.

The I. L. Ellwood Mfg. Company, of Dekalb, Ill., have been incorporated with a capital of $500,000 to manufacture barb wire and other products. The incorporators are Isaac L. Ellwood, Hiram Ellwood and Edward C. Lotta.

The Brainerd Bolt Company, of Chicago, have also been incorporated with a capital of $500,000. They will manufacture steel and iron bolts. The incorporators are A. M. Brainerd, A. C. Webb, W. R. Jerome and M. J. Enright.

The United States Scale Company, of Terre Haute, Ind., report trade better than usual during the spring months. Despite the natural gas there is great activity in the coal-mining business, and the demand for railroad scales in this line of business is greater than ever before. They report recent shipments of five 50-ton scales to one firm in Ohio; one 50-ton, 54 feet long, to Kanawha and Lake Erie Coal Company, of West Virginia; one of the same kind to the Leavenworth Coal Company, Leavenworth, Kan.; also same to Glendale Coal Company, St. Louis, Mo.; also same to S. W. Little, Evansville, Ind.; and one 40-ton, 36 feet, to Charles Valier, Greenville, Ill.

Miscellaneous.

There were shipped from the ports of Marquette, Escabana and Ashland during the week ending May 1 133,763 gross tons of iron ore, of which quantity 16,741 tons went from Marquette, 86,347 tons from Escabana, and 30,955 from Ashland. Shipments have begun from the Vermilion, Minn., mines also, but the report from Two Harbors has not yet reached us. With the Two Harbors shipments added, the shipments for the week would no doubt be 150,000 tons, which is well up to the average weekly shipments of previous years after the season had fairly opened. At this season in 1888 no ore had yet gone forward, so it will be seen that the mines are getting a good start over last season in the matter of getting their product to market.—*Mining Journal.*

The works of the Novelty Steel Wheel Company, recently organized in Pittsburgh, will be located at Bissell, on the Baltimore and Ohio Railroad. The main building will be a two-story iron structure 40 x 208, and the machinery, which will be of a special design, will be made in Philadelphia. The works will be in operation in about three months and will furnish employment to about 75 men at the start.

The Wrought Iron Bridge Company, of Canton, Ohio, have just secured the largest single contract they have ever taken. It is for the structural iron-work of a massive all-steel viaduct for the Denver Cable Railway Company, of Denver, Col., which will require for its building over 1000 tons of steel structural work and over 1,000,000 feet of lumber. To transfer the steel-work it will require 75 cars, and this will be the largest shipment ever sent out of Canton. The price is $135,000.

The annual meeting of the stockholders of the Philadelphia (Westinghouse) National Gas Company was held in the office of the company at Pittsburgh last week. George Westinghouse, Jr., president, was in the chair. According to the statement read by Mr. John Caldwell, treasurer, the total assets of the company amount to $10,805,838, an increase of $1,100,000 over last year's assets. The gross earnings during the year were $2,756,217 and the expenses $1,696,293, leaving net earnings, $1,059,923. The dividends paid during the year amounted to $900,000. The company operate 181 producing wells and have 706 miles of pipe laid. From Mr. Paine's report it was learned that the company propose to pay the dividend quarterly instead of monthly, which was accepted. The new steel line which the company are laying from Thirty-third street to Leamington avenue and Tilford station is estimated to cost $300,000. Seventy-seven miles of new telephone lines have been laid by the company during the year. The company have only sold $375,000 of $2,500,000 bonds issued, and it was stated by Mr. Westinghouse that the directors had been hampered in selling any more because the Chartiers Company were selling theirs cheaper than the Philadelphia Company would let them go. Ninety-four thousand votes were cast on the election of the board of directors, and the old board was re-elected. Their names are: A. M. Byers, A. Groetzinger, Robert Pitcairn, Charles Paine, John Caldwell, C. H. Jackson, J. A. Chambers, Calvin Wells and George Westinghouse, Jr. Subsequently the board organized, and the following-named officers were elected: George Westinghouse, Jr., president; Charles Paine, vice-president and general manager; J. R. McGinley, secretary and general agent; John Caldwell, treasurer; T. A. Gillespie, general superintendent.

The Hall Mowing Machine Company have been incorporated at Portland, Me., to manufacture lawn and field mowers under the patents granted George A. Hall. President, Hon. Charles J. Chapman; clerk, Seth L. Larrabee; treasurer, Clinton A. Woodbury; superintendent, George A. Hall. Directors: Hon. Charles J. Chapman, Geo. A. Hall, William H. Stevens, C. A. Woodbury, T. B. Percy.

Among recently authorized corporations in the State of Illinois are the following: The Lewis Metallic Packing Company; capital, $30,000; for the manufacture of piston-rod packing; incorporators, G. C. Fry, A. D. Lewis and J. E. Babb. The Anti-Railroad-Frog Company; capital, $3000; for the manufacture of substitutes for railroad frogs and other railroad appliances; incorporators, A. A. Ackerly, L. Bartlett and W. P. Graves. The Chicago Matrix Machine Company; capital, $1,000,000; for the manufacture of matrix-making machines; incorporators, E. B. Springer, G. M. Brinkerhoff and P. H. Gunckel.

Rates on Cotton Ties.—The freight agents of the railroads having connection with Pittsburgh have reduced the rates on cotton ties from that city to East St. Louis to 14½ cents in carload lots and to 18 cents in less than carload lots. The rate to Cairo, Ill., has been reduced to 17 cents in carload lots and 21 cents in less than carload lots. From the Mahoning and Shenango valleys the rate on the same article to East St. Louis has been reduced to 12½ cents in carload lots and to 16 cents in less than carload lots. To Cairo the rate has been reduced to 15 cents in carload lots and 19 cents in less than carload lots. The new rate from Pittsburgh went into effect on the 13th inst., and the new rate from the valleys on the 10th inst.

The Grand Jury at Bridgeton, N. J., has indicted Master Workman Coffey, of the K. of L., for inciting men to strike recently in a factory in that place.

The Iron Age

New York, Thursday, May 16, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Chicago editorial and business offices of *The Iron Age* have been removed from 95 and 97 Washington street to 59 Dearborn street.

Eastern and Western Pig-Iron Prices.

The Western newspapers have treated the announcement of the Thomas Iron Company's reduction in the price of pig-iron as a sensation worthy of glaring head-lines. To them this change in prices comes like a revelation, and they are bound to make the most of it for the benefit of their readers. The effect of the sensational statement that pig-iron has been reduced $1.50 per ton by the leading manufacturers of the East has been quite marked in the West. The circumstances under which this reduction of price was made were fully set forth in our last issue, and it was clearly shown that the company had been for some time sustaining the market for native iron considerably above the rates at which other iron could be bought. This does not seem to have been fully understood in the West, but consumers believed that the whole range of Eastern prices had been suddenly dropped $1.50 per ton. They therefore, in a number of instances, have argued with Western sellers of iron that prices would have to come down in that section to correspond with the new range of values established in the East. If it were true that Western prices had been maintained at about the same rates as the Thomas Iron Company's former figures, the reduction would probably take place in time out of sympathy with the condition of other markets. But this is not the case. The reduction just announced in the East was made long since in the West.

It is a remarkable fact, which Western consumers of pig-iron do not seem to realize, that for some time pig-iron has been quoted at lower rates at Chicago than at any other Northern consuming center of any prominence. Our market reports have shown this from week to week. Cincinnati, Louisville and St. Louis are cheaper pig-iron markets, but as they are just on the border and handle a great preponderance of Southern iron, they are excluded from this comparison. The market reports in our last issue quote No. 1 Northern foundry iron at $16 at Chicago, against $17 to $18.50 at Philadelphia, $17 to $17.50 at New York and $16.25 to $16.75 at Pittsburgh. Southern foundry iron is available at $16 at both Chicago and New York. It will be seen that at Chicago either native or Southern iron can be had at the same price, which is not the case in Eastern markets. This puts the Chicago consumer in a much more favored condition than his fellows enjoy in the East. And this advantage he has had for months, as will be seen by reference to our market reports. It would therefore seem to be wholly unreasonable for a Western consumer to expect that because Eastern prices have been reduced to nearly the Western level a further decline should be made in Western prices.

The change in the Western iron trade which has taken place within the past year or two has been so radical that it is not yet fairly understood and does not receive proper consideration, even among those who should be thoroughly informed. The time has been when Chicago prices were based on rates established at points further East, the difference depending mainly on freight schedules. At such a time the action of an important Eastern furnace company in raising or lowering prices would have had a decided effect on prices at Chicago. But those days have passed, probably forever. The consumption of pig-iron in that section might increase so rapidly that the local furnaces could not supply it, and in that event prices would be somewhat dependent on quotations made by distant makers; but such a contingency is certainly remote. Meanwhile Western prices for pig-iron will be regulated by the natural laws of supply and demand within the territory tributary to the furnaces and without much regard to occurrences in distant markets, until they assume a much more general character than this recent action of the Thomas Iron Company, which has been so widely published. Western prices may recede slightly from their present range, but it is altogether unlikely that they will fall $1.50 per ton more during this particular period of depression.

The Competition of Canadian Railroads.

The Interstate Commerce Committee of the United States Senate, during their sessions in this city last week, do not seem to have found much of a case against the Canadian railways. The argument in favor of protection to American railroads, as well as to American manufacturers, is of course sound, but the analogy seems to end with the theory. No testimony has been offered to prove that, as a matter of fact, Canadian roads were offering unjustly low rates. At first the committee seemed to misapprehend the differential rates question, thinking them to be favors to the Grand Trunk, but it was explained that lines like the Chesapeake and Ohio and the Chicago and Atlantic, in our own borders, had them. Albert Fink's testimony that they were fair seemed to dispose of the question. The subsidy granted the Canadian Pacific was given, but no evidence was offered to show that the American lines were injured by it.

The testimony of the merchants before the committee was entirely in favor of allowing the carriage of goods through Canada to continue. It was shown that American interests were deeply involved in the question, and it is probable that a policy of exclusion would cause more loss to our own citizens than to Canadians. Nearly every Eastern railroad except the Pennsylvania and the New York Central would be hurt. The Central Vermont would be greatly injured. The commercial interests dependent upon direct transportation through Canada are very large; sudden stoppage would mean hardship to many of them, and this alone is reason enough for its continuance. Our down-East friends at Portland, Me., and throughout New England would be deprived of one and in some cases the only outlet to and from the West. Detroit and all of Michigan would be put in a sort of business *cul-de-sac* for their trade Eastward. Chicago has for some time been favorable to the Grand Trunk, the merchants thinking that that company have kept rates down. St. Paul, Minneapolis and the Northwest would lose a valuable route for flour and merchandise. The moment the possible results of a stoppage of the bonding privilege, and consequently of carriage of goods through Canada, are seriously contemplated it becomes apparent that without strong and convincing reasons the business men of the United States will not consent to bear the losses which such a stoppage would necessarily entail upon them.

The discussion of the witnesses took a range wider than the subject in hand, embracing all the results of the Act to Regulate Commerce. There was a surprising unanimity of sentiment in favor of the law. Not one railroad manager or business man advocated the repeal of the act, though amendments were suggested, and even of these many were such as to be now practically in the power of the commission to effect without changing the law itself. Pooling was thought necessary by the railroad managers, but was asked for only under careful restrictions. Merchants thought that business men had not been enough consulted by the classification and rate committees of the railroads, and undoubtedly the complaint was just. The president of the Union Pacific seemed to utter the general opinion when he said that the law ought not yet to be modified, and meanwhile that it should be rigorously enforced. The prevailing sentiment seemed to be that as yet the alarm raised against transportation through Canada had but little foundation.

A brief cable dispatch, remarkable chiefly for the number of errors which the sender managed to crowd into about 30 words, announces that the Iron and Steel Institute of Great Britain will hold a meeting in the fall of 1890 on this side of the Atlantic. We may state that the invitation emanated from the Council of the American Institute of Mining Engineers, who, we understand, have informed the governing bodies of the American Society of Civil Engineers and the American Society of Mechanical Engineers, coupling their preliminary announcement that an invitation had been sent with the suggestion that the societies in question co-operate with the mining engineers. We understand that Andrew Carnegie has been named as the chairman of the American committee, which will embrace the leading manufacturers of iron and steel in the United States, and will include the most prominent engineers. No efforts will be spared to make the visit of the English iron-masters memorable to them professionally and socially, and they will be certainly afforded every opportunity to study our resources and our methods of manufacture. It is probable that a joint meeting of the English and American societies will be held at some central point, possibly Pittsburgh, and it may be arranged that such Continental organizations as the Verein

Deutscher Eisen-Hüttenleute, a worthy rival of the Iron and Steel Institute, will participate.

The Trade of Chicago in 1888.

The magnitude of the business interests of Chicago is most comprehensively shown in the report just issued by George F. Stone, secretary of the Board of Trade. He has gathered from all sources facts and figures bearing upon every branch of prominence represented in the trade of Chicago, and has incorporated with them a large accumulation of statistical information relative to national matters of interest to business men. The tables cover population, public debt statements, valuation of property, prices of farm products, exports and imports, crops produced for a series of years, &c. The report has been prepared with great care and forms a valuable addition to our statistical literature.

Referring to the trade of Chicago, the very important fact is pointed out by Mr. Stone that by far the largest class of manufacturing industries, except what is known as meat production, is that relating to iron and steel. The rolling mills in and near Chicago turned out in 1888 a product valued at over $16,000,000 and employed nearly 700 hands ; the foundries, machine shops, boiler works, car-wheel works, stove works, &c., turned out a product valued at $28,000,000 and employed over 10,000 hands. The quantity of pig-iron handled was necessarily very large, aggregating 850,000 tons, valued at $17,000,000. The wholesale trade in manufactured iron and hardware, in which some of the largest jobbing houses in the country are interested, amounted to $11,500,000.

As Chicago is particularly conspicuous for meat production, the statistics of this branch of business are worthy of consideration. Meat production includes hog-packing, beef packing and canning, and the manufacture of refined oil, stearine, butterine and sausage. The total value of this production in 1888 was $95,000,000, and 20,000 hands were employed. A comparison of these figures with those of the preceding paragraph shows that the iron and steel business of Chicago is fast overtaking the line which has hitherto been most prominent in the trade of the city. Those who are most familiar with the developments of the past few years in the Chicago iron trade will not be surprised if a further rapid advance is made in the near future which will thoroughly establish the ascendency of iron and steel over all other interests represented in that city.

The statistics of other trade movements at Chicago reach enormous figures. For instance, the receipts of flour and grain in 1888 aggregated 182,588,188 bushels; the number of hogs received was 4,938,413, together with 2,611,543 cattle and 1,515,014 sheep; the lumber received amounted to 2,066,927,000 feet; the tonnage of vessels arrived during the year was 4,393,768 tons; the total number of miles of railway tributary to Chicago is 70,431, of which 41,370 miles lie west of the Missouri River; the total bank clearings for 1888 were $3,163,774,462; the number of manufactories is now 2400, employing a capital of $117,000,000, giving work to 132,000 hands, to whom yearly wages of $74,000,000 are paid, and turning out a product valued at $402,000,000; the wholesale trade in all lines amounted to $455,000,000 in 1888, against $370,000,000 in 1884; the agricultural-implement industry of Chicago, although mainly confined to three large establishments, gives employment to about 4000 men, who turn out about $12,000,000 worth of goods annually; the receipts of coal in 1888 were 5,517,359 tons.

Although Chicago is an inland city, its trade connections have been well established over the civilized world. The direct importations of all classes of goods in 1888 amounted to $13,805,354. Among them were 397,641 boxes of tin-plate, 16 cases of needles, 2416 cases of manufactured metals, 1102 tons of pig-iron, 168 packages of hardware, 368 cases of fire-arms, 151 cases of cutlery and 25 cases of bicycles. Large quantities of manufactured goods are exported, as well as grain, flour and provisions, but it is impossible to obtain the statistics of such shipments, as they are credited in the Government reports to the cities where they are transferred on shipboard. The project of a navigable water-way from Lake Michigan to the Mississippi River, which has been constantly growing in favor and seems reasonably certain of being undertaken at an early day, derives much of its support from the desire felt by Chicago business men to secure as many channels of intercourse as possible between their city and remote sections. Such an outlet to the South will be found specially valuable in case the steamship lines now contemplated are established between Gulf ports and cities in Central and South America.

The Improvement in Mexican Affairs.

The improvement that has been going on during the past four years in nearly every department of national life in Mexico is very striking, and recent advances were dwelt upon in detail in President Diaz' message to Congress of April 1. Our industrial and commercial interests with Mexico have become so interwoven that the improvement in its finances through good administration of public affairs is a matter of much concern to the American manufacturers, merchants and railroad men. It is a subject for congratulation, too, that President Diaz has entered upon another term of four years, and that all the capable men who assisted him, together with Minister Romero at Washington, remain in office. When on December 1, 1884, President Diaz took the helm of State for the second time Mexican finances were in a terribly confused state, and there was little hope that the subsidies to railroad companies would be paid regularly for a long time to come. The recognized domestic and foreign federal debt of Mexico, after throwing out the Maximilian bonds and others like, for example, the famous Jecker bonds, amounted at the time to $144,053,785. The foreign debt, then aggregating $103,812,570, by honest arrangements and payments has since been reduced by no less than $87,000,000, and a large amount of floating debt been paid off. When President Diaz formed his present Cabinet in 1884 Mexican bonds were far below par in the London market. After a long negotiation Dr. Dublan, the Minister of Finance, completed an arrangement with Bleichroeder, of Berlin, by which a Mexican loan of £10,500,000 was to be placed upon the foreign market at par, the payment to be in Mexican foreign bonds at 50 per cent. of their face value. This, of course, meant practically to reap the advantage of an understanding previously arrived at with the British bondholders to cancel their 3 per cent. bonds within a given time at 40 per cent. Bleichroeder took £7,600,000 at 84, with the proviso that he could call for the remainder of the bonds if they proved popular, and on May 1 last the Government made the official announcement that the Berlin banker had made a demand for the remainder, for which he held an option. In President Diaz' message we find the following passage: "The interest on the home and foreign debts has been met with strict punctuality on the day of maturity. The bonds of the Berlin loan are now quoted in Europe at 93½; the reserves are increasing, the collections in the first half of the current fiscal year being greater than in the corresponding period of the previous year."

Other portions of the message related to public works. Mexico, according to this document, has at present about 5000 miles of railroad in operation (against 3438 on December 1, 1884), and a number of new lines are now under construction and in part built. Mexico has nearly 14,000 miles of telegraph lines. The culture of the vine and of silk is rapidly increasing; the army has been reduced. He remarks:

The mining industry continues in full development, and the good effects of the law of June 6, 1887, in regard to the concessions of mining zones, are visible in the number of contracts that have been made in accordance with its prescriptions. Their number is 155, of which nine have been declared forfeited, and four zones covered by as many of the forfeited contracts have been newly solicited. The contracts now in force promise an investment in mining enterprises of more than $40,000,000, and the amount deposited in public-debt securities, bonds of the mortgage bank, and in cash, as a guarantee of the fulfillment of those contracts, is $280,000. In order to facilitate information in regard to the country, &c., Mexico participates in the Paris Exposition, and pains have been taken to send thither a complete collection of such objects and products as will convey an adequate idea of its resources and industries. The day is not far off when our national establishment of pisciculture will begin to show useful results ; a similar establishment in the United States has favored us with important gratuitous assistance. From September up to the present more than 5,000,000 hectares of public land have been surveyed by companies duly authorized, thus adding to the area available for colonization or sale. Indeed, through the land sales in the border States large areas have been opened which were formerly unproductive, enhancing the value of private property and increasing the revenues of the States named. The Vera Cruz harbor improvement works have continued without interruption, 1170 blocks of 14 c. m. having been submerged. These blocks will gradually form the foundation for the great breakwater that is to protect the port on the northwest. The hydraulic works undertaken to protect the bank of the Rio Bravo at Ciudad Juarez (El Paso) are on the eve of completion, seven jetties having been constructed in that locality and three at Matamoras; these, in connection with those existing at the latter point, will protect the city from serious dangers that threaten it. The Department of Public Works and its subordinate offices have prepared a general map of the country, as well as nine special charts of the railways, telegraph lines, geology, mining, &c., and four agronomical charts exhibiting

our chief agricultural products. All of these, together with the topographical charts prepared by the geographical exploring commission, and those prepared in other sections of the Department, with a number of documents of various sources, are to go to the Paris Exposition. The ten mints of Mexico coined in 1888 in the aggregate $6,276,364 silver. The common school system is meeting with popular favor, and regulations for primary compulsory education will now be completed, while for the training of male teachers a normal school has been established, and the furniture and apparatus for a normal school for female teachers are now being put in place.

This item of education is of all the greater importance in view of the fact that of the 12,000,000 inhabitants only 19 per cent. are whites, 38 per cent. pure Mexicans and 48 per cent. mixed races. The number of wild Indians (chiefly in Yucatan) does not exceed 15,000; the rest are civilized, till the soil and are employed in manufacture, &c., but millions of them still speak the native Mexican tongue. To thoroughly educate these masses is therefore conferring a boon which cannot be estimated too highly. In fact, as our extracts from the message show, there is not a branch that is neglected in the Republic.

Cable Yoke Contracts.

The introduction of cable propulsion for street-cars has opened up a new field for foundries, particularly in the West, where the system has met with marked favor. The cast-iron yokes which are used to support the rails and the cable conduit furnish a great deal of work to foundrymen, as but a few miles of cable road will require yokes whose tonnage runs into the thousands. The competition for this class of business has been very animated among the foundrymen of the West, as the corporations building the roads are usually well equipped with funds and are very desirable customers. The work appears to be specially inviting, all the yokes being practically of the same dimensions and weight. This competition has forced prices to an unnaturally low point, and it is not singular that foundrymen are considerably exercised at this condition of affairs. A peculiar feature of these yoke contracts is that those who have had experience in manufacturing them, and therefore should be presumed to know how closely they could safely make their bids, are always beaten by inexperienced firms. A leading construction company who have built quite a number of cable roads in the Northwest state that every time they let a contract for yokes it is to a new foundry, whose estimates of cost undergo a radical reconstruction after the work of manufacturing them has actually been begun. Experienced Chicago foundrymen agree in placing the cost of manufacturing yokes at $27 per ton with pig-iron at $14 per ton, and their bids on this class of work range from $28 to $30 per ton, according to the profit which each thinks he should have. Yet other foundrymen, who pay the same price for pig-iron and the same wages to their molders, turn in their bids whenever a new contract is to be given out at several dollars a ton below the actual cost stated above, and take the risk of imperfect castings and the large percentage of rejections which is inevitable under the rigid system of inspection adopted by the builders of the roads. It is not surprising that they lose heavily on these contracts and join the high bidders the next time. But a new candidate for the honor of making yokes at a low price then steps in, and with a serene confidence in his ability to keep down costs takes the work. It had been supposed that several occurrences of this kind would impart a general knowledge on the art of making yokes profitably to the foundry trade, but this does not seem to be the case, and a branch of business which should be of great importance to foundrymen bids fair to continue profitless until many more manufacturers have acquired experience.

The Charcoal Furnaces on May 1.

There has been a slight increase in the capacity of the charcoal plants operating throughout the country, due chiefly to the blowing in of a few of the larger plants.

Charcoal Furnaces May 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England	14	7	560	7	530
New York	10	3	412	7	520
Pennsylvania	33	3	210	20	849
Maryland	8	3	381	5	285
Virginia	23	1	42	22	904
West Virginia	3	0	0	3	165
Ohio	13	6	328	7	347
Kentucky	2	1	120	1	100
North Carolina	2	1	70	1	70
Tennessee	8	3	901	5	730
Georgia	2	0	0	2	114
Alabama	9	9	1,798	0	0
Michigan	25	11	3,859	14	3,162
Minnesota	1	0	0	1	190
Missouri	3	1	281	2	528
Wisconsin	7	3	1,411	4	491
Texas	1	0	0	1	173
California	1	0	0	1	120
Washington	1	1	175	0	0
Oregon	1	1	181	0	0
Total May 1	157	54	10,629	103	9,278
Total April 1	167	53	10,173	114	10,956
Total March 1	167	55	11,081	112	10,981
Total Feb. 1	167	62	11,219	105	10,406
Total Jan. 1	169	67	11,946	102	9,822
Total Dec. 1	169	71	12,286	98	9,397
Total Nov. 1	169	73	12,724	96	8,941
Total Oct. 1	175	71	11,619	104	9,083
Total Sept. 1	176	67	11,243	109	10,004

In Pennsylvania Mont Alto suffered from a disastrous fire and Eagle went out for repairs in April. Pine Grove, remodeled, started successfully on the 22d under the superintendence of S. R. Still. The furnace has been relined, its hight, diameter of bosh, crucible, the hight of its cinder-notch and of its tuyeres was changed, and practically a new hot-blast oven was built. In Maryland both the Stickney furnaces are at work, No. 1 Maryland was started in April, and Muirkirk is to blow in this month. In Kentucky Hunnewell is again running. In Ohio Mount Vernon blew in during April. In Michigan the total product of the furnaces, all of them reporting, was 15,644 tons. Gaylord blew out for the purpose of making general repairs, which will probably consume three months. Pine Lake blew in late in April. The Pioneer has made an exceptionally good run during April, the average daily product for the whole month being 77 6 tons. In Wisconsin Hinkle was stopped nine days and did not therefore make its usual heavy monthly product. In Missouri Sligo blew out on April 14, but is expected to resume at an early date. La Grange, in Tennessee, started in April, and the old Standard, now controlled by the Warners, has probably been making iron for some days. In Alabama No. 1 Shelby has gone out, to be rebuilt entirely.

Secretary Tracy has extended for four months and four days the time allowed the Union Iron Works, of San Francisco, in which to complete cruiser No. 5 (the San Francisco). This is one of the large 4000-ton cruisers which was contracted for October 27, 1887, at a cost of $1,428,000.

CORRESPONDENCE.

No Case of Yellow Fever at Sanford.

To the Editor: I notice in your current issue a statement that Sanford has a case of yellow fever, resulting in death, &c. Will you allow me to say that, despite the State Board of Health, we have not had a case of yellow fever in this city either this or last year? The diagnosis of the reputed case was made by an alarmist who is desirous of making for himself a reputation as a fever expert, even if he has to make such reputation at the expense of his friends and fellow-citizens. There is not to-day, nor has there been since the death of Mrs. Demont, a sick person, male or female, in the city or suburbs. The suspect camp, originated by these expert (?) doctors, has been broken up and all restrictions to travel, &c., removed. As soon as Dr. J. Y. Porter, the State health officer and an experienced yellow fever expert, came on the ground and investigated the foolish, senseless scare and quarantine caused thereby he immediately modified it and removed a great many restrictions.

It is our misfortune that we are harassed and afflicted with an army of self-constituted crank doctors, from whom as yet there is no immunity, but we would be a grateful people if the press of the country would take no heed, and thus protect us in this way. Kindly give a part of this letter the same prominence as you did the notice of the "Case of Fever at Sanford," and oblige, yours truly,

WILLIAM T. COTTER.

Sanford, Fla., May 7.

The gun-boat Petrel, built by the Columbia Iron Works, Baltimore, was given a trial trip to test her engines. While she did not come up to the requirements of the Government as to horse-power, she showed herself fully capable of doing it when the machinery was in perfect working order. Between Seven-Foot Knoll and North Point she averaged nearly 15 knots with her engines working 110 revolutions a minute, and on the last quarter nearly 17 knots. It took 1½ minutes to stop her when going at full speed and 28 seconds from full speed to reverse her. The best test was made when she ran 17 knots with 115 revolutions. William H. Varney, superintendent of hulls for the Government, said that he was very much pleased with the trip and was sure the new boat could make an average run of 15 knots with the 1350 horse-power required by the Government. The Government trial trip, which must be taken before the Petrel is turned over to take her place in the reconstructed navy, will be made in about three weeks.

An unofficial trip of the uncompleted cruiser Charleston was made between San Francisco and Santa Barbara with satisfactory results. A maximum speed of a little more than 14 knots an hour was made, and a steady speed of 11 knots was maintained in a rough sea.

A convention of the American Society of Civil Engineers will be held at the Octagon House, Seabright, N. J., on June 26. About 250 delegates and visitors will be present, and the convention will be in session for one week.

The Royal Society, at Ottawa, have appointed a committee to welcome the American Institute of Mining Engineers on their visit to Canada next fall.

THE MECHANICAL ENGINEERS.

The Erie Meeting of the American Society of Mechanical Engineers.

The nineteenth meeting of the American Society of Mechanical Engineers is now in session. Among the members in attendance or expected are the following: Horace See, H. R. Towne, F. H. Ball, F. F. Hemenway, John W. Weston, J. L. Horning, A. L. Ide, W. M. Welken, C. H. Parker, C. H. Manning, F. R. Low, C. W. Bray, William Roberts, F. M. Hartreck, W. S. Doran, E. H. Parks, C. D. McDuffie, G. H. Smith, R. J. Gilmore, Prof. F. R. Hutton, S. A. Smith, A. L. Burns, W. W. Sprague, F. A. Shaffler, E. W. M. Hughes, J. S. Miller, H. R. Barnhurst, J. A. Gilkerson, W. C. Jones, L. C. Skinner, J. H. Raymond, J. K. Hallock, E. Fawcett, W. H. Wiley, D. Ashworth, W. A. Ball, E. F. Davies, C. M. S. Smith, J. H. Cooper, H. H. Supplee, W. J. Creelman, Prof. De Volson Wood, J. W. Cloud, C. W. Nason, Alfred Betts, C. M. Morse, H. W. Spangler, W. L. Clark, Prof. J. E. Denton, Prof. J. D. Webb, T. J. Ridgway, George W. Passel, E. L. Moore, William Hardwick, R. W. Ryan, William Ruth, J. G. Sowter, S. Higgins, S. J. McFarren, Harris Tabor, Geo. Higgins, W. F. Mattes, Charles Bauer, F. G. Coggin, E. J. Fickengier, J. H. Springer, Henry Buckley, E. A. Mehling, Lycurgus B. Moore, A. F. Nagle, H. I. Snell, L. S. Randolph, J. J. Illingworth, James B. Ladd, Francis C. Blake, W. W. Drummond, A. P. Trautwein, John Skenson, J. C. Debes, A. C. Christensen, Peter Kirkeraag, R. H. Soule, R. W. Bailey, Thomas D. West, J. A. Roche, Charles J. Hillard, F. W. Taylor, A. E. Manchester, Edwin Reynolds, F. D. Potter, W. G. Stewart, L. G. Laureau, Alfred R. Wolff, F. H. Pend, John Dick, R. C. Carpenter, John Walker, William Forsythe, Geo. A. Porter, James N. Warrington, C. J. Woodbury, D. W. Payne, A. M. Goodale, Prof. R. H. Thurston, John L. Gill, J. L. Bancroft, Coleman Sellers, Jr., B. H. Warren, August Sinclair, Samuel Higgins.

On Tuesday afternoon the members visited the water-works on the shore of Lake Erie, and examined the 5,000,000-gallon Gaskill compound duplex pumping engine, and also the pair of old Cornish pumps of same capacity. The two engines furnished an interesting study of the past and present methods of raising water. From the top of stand-pipe, which is 250 feet high and the third highest in the world, a very few of the visitors obtained a grand view of city and lake. At

The Evening Session

Mayor Clarke heartily welcomed the engineers, and hoped that their visit to the city, whose prosperity was largely due to the efforts of resident members of the society, would be remembered with pleasure. President Towne thanked the Mayor for his kind words of greeting. After the address a most tempting repast was served.

The address of ex-President Horace See, which should have been delivered at the meeting in last October, but was postponed because of his severe illness at that time, might have been termed "Practical Education." As the supply of skilled workmen is insufficient to meet the demand which the marvelous growth and diversified character of our manufacturing interests has created, numerous schemes have been advanced for the education of the young to fill any position, from the workman to the manager. It has been suggested that the mechanic arts high school be brought into our existing system of public education, the course of study to be three or four years, two-fifths of the time daily being given to selected or graded shop-work, one-fifth to drawing and two-fifths to appropriate book-work. This plan is not favored, as the boy, after having obtained his load of science, technology, industrial art and commercial activity, cannot be brought to work at the trade, as he aspires at once to something higher. One of the most prominent schemes, on account of the large endowment of the institution, and one which shows how far from natural methods the teaching of the young to become skilled workmen is drifting, is that of a free school to be located in an agricultural country at a distance from manufacturing establishments. It is important that the machinist acquire his skill by contact with the best mechanics, by practice in and by familiarity with the customs, usages, character and variety of work of the workshop.

"It would be a great advantage to our youths if the common school education were modified so as to call on all of the faculties of the mind, and not to rely so much on cramming the memory. The eye should be taught early to perceive, and the hand to delineate, the objects around. The knowledge acquired in this way would be real, and of more value to the possessor than all that is abstract in most of the pursuits of life. Let us bend our efforts and lend our assistance to hasten the time 'when,' says Sweet, 'more of the mechanical branches of our educational institutes shall find their true position, and where the students shall be instructed by example of noble work, rather than by the toy models abounding in confusing complication which they cannot understand, and which are constructed regardless of proportion and meaningless in design, and are pernicious in every sense of the term. Let us hope, if the tide of human progress is sweeping on toward a more useful education, that the day may not be far away when he who knows what to do and how to do it will be regarded as the equal of him who only knows what has been done and who did it.'"

Wednesday Morning.

On Wednesday morning the report of the council showed a total membership of 986.

The following deaths were reported: Daniel N. Jones, C. H. Delamater, John Ericsson, H. F. Gaskill. The council prepared a minute stating that in the death of Captain Ericsson the profession of mechanical engineering had lost one of its most illustrious representatives, whose life spanned the entire epoch of the locomotive. The resolutions briefly cited the great works done by the immortal Swede, and closed with the following:

That a committee of the American Society of Mechanical Engineers be appointed by this council to memorialize the Government of the United States to commemorate in some suitable manner the prominent services rendered to this country at a time of great national crisis by the engineering genius and skill of our late member, Capt. John Ericsson.

The first paper presented at the Wednesday morning session was by Thomas S. Crane, on "The Piping of Steel Ingots." This we publish in full elsewhere in this issue. There was no discussion.

The next paper was by Henry R. Towne, on "Gain-Sharing," a term coined to distinguish the system proposed from "profit-sharing." The fuctus affecting the profit fund of a manufacturer who buys raw material, makes it up and sells the products, may be divided as follows:

1. Those contributed by the owner, such as capital, buildings, plant.

2. Those influenced by the mercantile staff—the buyer and selling agent.

3. Those determined by causes beyond the control of the principal and his agents, such as fluctuations in cost of raw material or in the market value of the finished product, losses by bad debts, &c.

4. Those influenced by the workmen, such as care of property, economy in the use of material and supplies, and, chiefly, efficiency in the use of machinery and employment of labor.

"Now, it is obvious that while the operatives may influence the items in the fourth or last group to an extent which may be large, or even controlling, in determining the question of profit or loss, they have little control—and in most cases none whatever—over the items specified in the other three groups; and that to admit them to participation in the net results of the whole business, while commendable as an act of generosity, is not defensible either on an equitable adjustment of the complex and often conflicting interests involved, nor as a theoretically correct solution of an economic problem. The right solution of this problem will manifestly consist in allotting to each member of the organization an interest in that portion of the profit fund which is or may be affected by his individual efforts or skill, and in protecting this interest against diminution resulting from the errors of others, or from extraneous causes not under his control. Such a solution, while not simple, is attainable under many circumstances, and attainable by methods which experience has shown to be both practical and successful." Having ascertained the cost of the product in labor, supplies, &c., the principal offers the employee one-half of any gain or reduction of cost which he may effect, the wages to be those generally paid for similar services. If the total gain was $800 and the aggregate wages paid during the year $10,000, then one-half of the gain, or $400, would be paid to the operatives, each of whom would be entitled to a dividend of 4 per cent. on his earnings during the year. This is the "gain-sharing" system. As the foreman has more power and control than any subordinate, it is proper that his interest should be larger, and the author of the paper prefers to allot him a definite part of the profit fund—from 10 to 15 per cent. Mr. Towne also considers this method as applied to the contract system of work. It has been found very beneficial to have posted in each department where the gain-sharing system is in force a suitable blank on which can be entered each month the net results of the working for the preceding month, and including a statement of the rate of dividend earned since the beginning of the contract year. The stimulus thus given to the interest of the employees is very marked. Another important point is the question of the length of time during which a contract for gain-sharing shall continue without modification. When the cost of the product is accurately known a contract may be safely made for a long time, from three to five years, but when the cost is not well known it is better to fix the terms for a shorter period.

"In the case of a foundry, the gain-sharing system can be easily and advantageously applied. Here economy of material as well as efficiency of labor is largely under control of the operatives, and should be made a factor in the account. This can be accomplished by basing the 'cost of product' upon the ascertained results of a previous period, labor and miscellaneous items of small supplies being charged up at actual cost, and fuel and metal being charged according to an arbitrary scale of fixed prices, which may conveniently be determined by adopting the average market rate during the previous year or at its close. The arbitrary values for material which are thus adopted are then incorporated in the gain-sharing contract, and remain unchanged during its period. The 'contract

prices' for finished product are deduced from the actual results of the preliminary period, the cost of material being calculated by extending the actual quantities at the arbitrary prices per pound or other unit which may have been adopted for the proposed contract, the employer using his discretion as to how close the contract prices should be to previous actual costs. Where the foundry product is of varied character, a separate price is fixed for each class of castings, and a record kept of the output of each."

Appended to the paper were the results obtained in a number of cases to which the gain-sharing system had been applied by the Yale & Towne Mfg. Company, of Stamford, Conn., and also the rules governing the system as applied to the foundry. The dividends ranged from 0.03 per cent., the smallest, to 0.123 per cent., the highest.

Professor Denton stated that gain-sharing would tend to make that workingman more contented who has a direct interest in the business. The system is tried on a small scale at the Stevens Institute, where the testing work coming in is distributed among the instructing mechanics, who are given an interest in the profits. As a result they always cheerfully perform any extra duty.

Mr. Towne stated in answer to a question by Professor Wood that he had made 21 contracts, and from his experience the system could be extended to embrace almost any line of manufacturing company. Professor Webb asked whether the system would not have a tendency to make each workman watch his neighbor and note the skill and energy he displayed in his work, and if decidedly incompetent to demand his discharge. Mr. Towne said although this had not occurred at his works, it had been found that the operatives exercised increased economy and care and that the general *morale* of the force was greatly improved.

The "Comparative Cost of Steam and Water Power" was considered in a paper by Charles H. Manning, the data being drawn from the towns of Lawrence, Lowell and Manchester, on the Merrimac River, which were created by their water-powers. The Lawrence water-power is owned by the Essex Company, who have sold 130 mill-powers. The unit of water-power varies slightly in the different places, that in Lawrence being 30 cubic feet of water per second on a fall of 25 feet, while at Manchester it is 38 cubic feet per second on a fall of 20 feet; the first being equivalent to 85.23 horse-power gross and the latter to 86.36 horse-power gross. Cost per horse-power per annum at Lawrence:

Under original leases	$10.55
Surplus water up to 20 per cent	14.51
Surplus water from 20 per cent. to 50 per cent	29.02
Under recent leases	14.08

At Lowell the cost is:

Under original leases	$10.55
Surplus water up to 40 per cent	18.14
Surplus water from 40 per cent. to 50 per cent	36.28
Surplus water from 50 per cent. to 60 per cent	72.56

At Manchester the cost is:

Under original leases	$10.42
Surplus water	7.15

In computing water-powers it is usual to subtract 1 foot from the head as measured from still water. The efficiency of the turbine being taken at 85 per cent. of the net fall, about 75 per cent. of the gross power paid for will be delivered to the shaft. Under the original leases the net horse-power costs $14. The total cost per net horse-power per annum under the original grants is:

Cost of water	$14.00
Sinking fund, &c	7.90
Attendance and supplies	.72
Total	$22.62

We now come to the steam side of the question. The cost per net horse-power per annum of a compound engine of 1000 horse-power is $21.16, and the cost per horse-power for a single-cylinder engine, the exhaust steam from which is used at a pressure of about 10 pounds above the atmosphere for other than power purposes, is $14.58.

D. W. Robb described "The Old Locomotive 'Sampson'" in an illustrated article which we shall publish in an early issue. The discussion of these two papers did not bring out any facts of general interest.

THE LEAD HEARING

(From Our Washington Correspondent.)
(By telegraph to The Iron Age.)

At 10 o'clock this morning about 50 gentlemen, representing the different interests involved in the importation, mining, smelting and handling of lead ores, gathered in the office of the Assistant-Secretary of the Treasury to present their conflicting views. Secretary Windom occupied a seat by Assistant-Secretary Tichenor, who had charge of the hearing. Among those present were ex-Secretary of War George W. McCrary, representing the Board of Trade of Kansas City; Delegate Thos. H. Carter, of Montana; Senator Wolcott and ex-Gov. J. B. Grant, of Colorado, representing the Omaha and Grant Smelting and Refining Company; George H. Loker, Jr., of the St. Louis Smelting and Refining Company; D. Sheedy, of the Globe Smelting and Refining Company; R. Myer, Kansas City Smelting and Refining Company; Mayor Van B. DeLashmutt; Mr. Shepherd, of New York City, and Joseph McCammon, of Washington, D. C.; ex-Governor Hauser and Russell Harrison, of Montana; C. W. Bennett, of Utah; ex-Minister Foster, of Mexico; ex-Senator Conger, Messsrs. Caswell and W. G. Vanhorn, of New York.

Delegate Carter, of Montana, opened the subject by going into a technical dissertation upon the relations of lead to silver in ores, and drawing a deduction that, while silver found in ores was not in sufficient quantities to justify mining and smelting, it afforded a small margin of profit to help out on the general results. He read certain official decisions of the Treasury, claiming that classification should be in accordance with the preponderance of metal in the ore, and not the component metal of chief value. He did not believe in putting lead ore on the free list because it contained other more valuable minerals which were free. The lead ores of Mexico are admitted free as silver ores because analysis shows silver in excess of value. This, he claimed, was unjust to home interests. He cited a decision in 1888, which ruled that when silver was the ore of predominating value it was subject to free entry as silver ore, and when lead was the chief value should pay a duty of 1½ cents a pound. He objected to this. He also dwelt upon the report of the United States Senate Committee on the Judiciary, which was to the same effect, and which he thought did not treat the question in its proper light. He said: "The matter at issue is the free importation of Mexican lead ores. Under a ruling of the Treasury in 1884 all ores in which the value of the precious metals exceeds the value of the base metal are allowed free entry as precious ores. Lead and lead dross are dutiable at 1½ cents per pound. But by this ruling lead ores are practically duty free. The Treasury returns show that the importation of dutiable lead ores from Mexico has almost ceased. Yet it is coming in by the train-load, with a sprinkling of high-grade silver on top, to give it an appearance of legality. Silver is found in carbonates and with galena, from which lead is obtained. The Treasury is not only being robbed outright and American mines seriously injured by this free importation, but the methods adopted in making the tests are wrong. Instead of pulverizing the ore in a body and getting an even sample to test the comparative value, lumps are taken at random and tested. Ore from the same vein runs unevenly, so a sample may be taken which will show 500 ounces of silver to the ton, yet by the other test the silver would average less in value than the lead. But we are anxious that all lead should pay the duty. Mexican mines are run with low-priced labor, against which our highly-paid mines cannot compete." Mr. Carter stated that but 1263 pounds of lead ores paid duty in one year, while 1,443,000 pounds were imported, defrauding the Government of duty to the extent of 1½ cents a pound.

Senator Walcott said the question was not one of interpretation of law, but, first, what is lead ore. All ores carrying over 5 per cent. of lead are lead ores. Outside of the ores of Iowa, Illinois and Missouri there are no ores in the world which do not carry silver. The Senator asked four hours to present their case and testimony, the same to be given the other side.

Judge McCrary for the opposition to the producers took the floor. He said that they were not here to legislate nor to usurp the powers of Congress, but simply to ascertain the intentions of Congress. The question, he said, has been so often decided by secretaries and the Judiciary Committee of the Senate that there should be no doubt on the subject. Secretary Sherman decided in 1880, before the act of 1883 was passed, that the value of silver in the ore should determine the classification, and if silver predominated in value the ore was subject to free entry. This, he said, is an old rule. Assistant-Secretary Fairchild decided it in 1886. The Director of the Mint passed on it in 1888, and others the same. The parties then went to Congress to ask a resolution of the Senate, and in 1888 the same ruling was sustained by a unanimous report from the Senate Committee on the Judiciary. Judge McCrary said that there was no instance where a Secretary of the Treasury has reversed a decision so strongly intrenched, and further that money was invested on the faith of those decisions. He then showed that the statutes provide in one paragraph for duty on three kinds of ore—lead ore, at 1½ cents per pound; nickel in ore, 15 cents on nickel contained therein, and copper in the form of ore 2½ cents on each pound of fine copper therein. He said the framers of the law knew what they were about, and if they intended to draw the line between lead and silver in the same ore they would have done so. The ex-Secretary's argument was brief, but laid down the principles which should govern the Department in dealing with the questions in very clear terms. Secretary Windom paid close attention. Delegate Carter's presentation of the case from the miners, and Judge McCrary for the importers and consumers of Mexican ores, represent the case as it will be discussed. Mr. Caswell and Mr. W. G. Van Horn, of New York, followed in favor of the home producers.

The hearing then closed until to-morrow.

The new steel ferry-boat Pierrepont, for the Union Ferry Company, of Brooklyn, launched from the ship-yard of Thomas S. Marvel & Co., at Newburg, on Saturday, is 209 feet long, 37 feet beam and 16 feet depth of hold. If the new vessel works satisfactorily the company will build two more of steel.

Bessemer Steel.

Its Composition for a Variety of Uses.

Robert W. Hunt, of Chicago, some time since delivered an address on the manufacture of Bessemer steel before the Franklin Institute at Philadelphia. It has just been printed in the *Journal* of that society, and contains the following results of a particularly valuable series of investigations:

I believe now, as I have always, that the more nearly you can have metal composed of only iron and carbon the closer you will be to the ideal. Unfortunately, in this, as in many other human matters, we cannot attain that sublime altitude, and so must be content to do the best we can with that which is vouchsafed us. If we can make one impurity offset the bad effects of another, we will accomplish the results which will be more orthodox in the metallurgical than the religious world. As we are forced to put up with the presence of silicon, sulphur, phosphorus and manganese, we must endeavor to compel as many of them as possible to be our allies. Leaving phosphorus out of consideration, we will first consider the effects of silicon. This element is recognized as valuable in rendering steel castings sound or free from "blow-holes," but has been generally regarded with disfavor by other steel makers. I do not fully agree with them in this condemnation when other than the very soft or high phosphorus metals are considered. Some years ago I made quite a full investigation of the composition of various steels of approved brands, and which had given satisfaction to many users for various purposes. I was particularly interested in my silicon results, and I herewith present some of them.

[We have tabulated the analyses given by Mr. Hunt as follows:

Steel for	Carbon.	Silicon.	Phosphorus.	Manganese.
1. Planters' hoes	0.76	0.185	0.059	0.441
2. Scarf steel	0.52	0.150	0.068	0.406
3. Circles and plungers for rifles	0.66	0.171	0.057	0 416
4. Machine screws	0.46	0.223	..	0.316
5. Hoes	0.61	0.158	0.086	0.445
6. Pitchforks and large forks	0 63	0.241	0.073	0.610
7. Planters' hoes	0.52	0.150	0.043	0.376
8. Gooseneck hoes	0.53	0.249	0.040	0.413
9. Spring steel, Jenks' English	0.64	0.145	0.088	.....
10. Spring steel, Jenks' English	0.52	0.150	0.060	0.03
11. Spring steel, Graves' Swedish	0.53	0.110	0.030	.....
12. Spring steel, Graves' Swedish	0.76	0.84	0.018	0.085
13. Spring steel	0.65	0.185	0.102	...
14. Hatchets	0.70	0.270	0.041	0.195
15. Swords	0.64	0.258	0.017	0.453
16. Scythes (German steel)	0.63	0.127	0.056	0.212
17. Cutlery, knife	0.51	0.180	0.029	0.265
18. Fork	0.49	0.335	0.030	0.444
19. Cutlery	0.61	0.210	0.046	0.402
20. Tool	0 88	0.220	0.023	0.140
21. Tool	0.85	0.204	0.022	trace.
22. Tool	0.85	0.190	0.022	0.174
23. Tool	0.86	0.216	0.030	0.091

No. 1 and 2, Lane, Gale & Co.; 3, Providence Tool Company; 4, Hartford Machine Company; 5 and 6, Huntly & Babcock, Utica, N. Y.; 7 and 8, Remington; 13, Naylor's, Bridgeport, Conn.; 14, Johnsville Axle Works; 15, Ames & Co; 16, stock used by A. S. Millard; 17 and 18, Landers, Frary & Clark, New Britain, Conn.; 19, 20, 21 and 23 made by Park Brothers; 22, Frith's English.]

I have before related that while I was making these investigations, and at the same time endeavoring to produce in the Bessemer converter steels to take the place of those, or as it was apt to be commercially put, "fill the bill at a less cost," I made a visit to the works of a firm, the members of which were and are highly esteemed by me, and whose products of the higher grades of steel have the very highest reputation. These gentlemen have always been progressive, and therefore their utterances are not likely to be controlled by prejudice; hence carry with them great weight. On the occasion of my visit I was full of what I was accomplishing in my converter. They treated me kindly, but said I must not expect too much. That in making the harder steels I would find silicon my constant enemy. As they happened, while we were talking, to be testing a piece of their own steel which was yielding splendid results, one of them said to me: "My dear fellow, when you can make such steel as that in your Bessemer converter we will begin to believe in it." I was thrown into a depressing state of humility and could with difficulty muster courage to beg a piece for analysis. It was most cheerfully given. The result was:

Carbon	0.86
Silicon	0.306
Phosphorus	0.016
Manganese	0.195

About this time several American makers of rifles and pistols were filling European contracts for both the Russian and Turkish governments. Most of them were using foreign iron and steel, the iron being of special brand known as Marshall. Supplying the requirements of these firms presented a tempting field, and we devoted ourselves to it. It did not prove such an easy matter as we fondly hoped, and it was only after numerous trials and some failures that we attained success. But we soon learned that to give a satisfactory gun-barrel steel the manganese must be kept somewhat low. Increasing it might make the steel sound and roll well, but it also caused it to throw a long chip before the drilling tool. This was very objectionable, as such chips would throw the necessarily long and slender drills out of line, and thus cause them to run to one side of the rifle-barrel. A very satisfactory metal had the following composition:

Carbon	0.29
Silicon	0.212
Phosphorus	0.048
Sulphur	0.065
Manganese	0.370

It is well known that manganese has a strong influence on the tempering characteristics of steel. Therefore it must not be in excess in any metal which will be tempered. It causes water-cracks and other undesirable qualities.

Lower Eastern Freight Rates.

The Philadelphia *Press* reports that the railroad companies have taken action on the complaints made by the pig-iron manufacturers that the freight on raw material was too high, and at a meeting held recently in New York it was decided to decrease the price for hauling Lake Superior ore or iron ore from Buffalo from $1.75 to 1.55 per ton—a reduction of 20 cents per ton—for every ton shipped. It is only within a few days that the freight agents of the various railroad companies would listen to talk of a reduction in the tolls, but when the Thomas Iron Company made its cut last week, giving as the reason that the Southern furnaces were treated better by the railroads than the furnaces North, and that at the present prices it was impossible to compete with them, they realized something must be done. The day following the Thomas Company's announcement the Pennsylvania Railroad sent out agents to several of the leading pig-iron and steel manufacturers to get information as to the advisability of making a reduction. The agents were all met with the same answer: "The freight on raw material is too high," said the iron men, "and we cannot make money at the present prices charged." The agents reported and a meeting of the general freight agents was called in New York, with the result stated.

The meeting was not altogether harmonious in more ways than one. Several of the roads were opposed to the reduction, but one of the agents said: "We intend to reduce the price on iron ore whether you do or not." This made a sensation, and after various plans were submitted the reduction was agreed to. The Reading Company were the first to enforce the new rate, for no sooner had it been made than they issued orders that it would go into immediate effect. They formerly charged $1.75 per ton for ore shipped from Buffalo to the furnaces on their line, but now the rate is $1.55. The ore is first taken at Buffalo by the Erie road, then to the Lehigh Valley road, which carries it to Bethlehem, where the Reading takes it to destination. The reduction applies to ore shipped to all furnaces along the line of the Reading. The Pennsylvania Company, it is understood, sent notice to all agents that the reduction would go into force at once. Several other roads have not yet made the reduction, but it is expected they will do so this week.

PERSONAL.

A. F. Raveret, formerly assistant superintendent of the M. C. Bullock Mfg. Company's works, at Chicago, has accepted the position of assistant superintendent of the Union Foundry and Machine Company, at Los Angeles, Cal. On the 11th inst. the officers and employees of the former company presented Mr. Raveret with a gold watch and chain, the presentation speech being made by F. H. Brown, foreman of the erecting floor.

Andrew Carnegie, the well-known iron and steel manufacturer, was in Pittsburgh for several days last week for the purpose of inspecting the various iron and steel plants in that city in which he is interested. Mr. Carnegie sailed for Paris yesterday to attend the exposition and to secure statistics concerning trade and commerce in the South American States. He thinks that in Paris he can easily procure all the information necessary to prepare him for his work as a member of the South American Commission.

Ladenburg, Thalmann & Co., bankers, of 46 Wall street, announce that Richard Limburger has become a partner of the firm, which now consists of Adolf Ladenburg, Ernst Thalmann, Richard Limburger, the estate of A. Limburger as general partners, and Gerson von Bleichroeder, of Berlin, as special partner, who has contributed $400,000 in cash. Karl Thalmann and Paul Lichtenstein sign by procuration.

G. W. Maynard, of New York; W. D. Cogswell, of Syracuse, and A. M. Shook were members of a party who have left for a brief trip to the New River District, Va.

Among the passengers departing by the City of Paris are Robert T. Lincoln, United States Minister to England; Allen Thorndike Rice, Minister to Russia, and Captain Zalinski, U. S. A., who will be military *attaché* to the United States legation in St. Petersburg.

Ex-Mayor Hewitt says he is in England to look into matters connected with the manufacture of steel, more particularly the basic process of making open-hearth steel.

Thomas F. Gilroy, Mayor Grant's appointee for the office of Commissioner of Public Works, took possession regardless of objections, under a decision of the Supreme Court.

Owners of junks on the upper Yangtse fiercely oppose the introduction of steam navigation, blockading the stream against any advance

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, May 13, 1889.

Pig-Iron.—Furnace agents report a slight increase in business in some quarters, with negotiations in progress for considerable quantities of both Coke and Charcoal Iron. Buyers are endeavoring to use the late reduction made by the Thomas Iron Company in the East as a club to knock prices lower here, ignoring the fact that Pig-Iron has for some time been sold lower in this market than the new rates made by that company. Prices were depressed more rapidly in the West than in the East, making Chicago for the past few months the cheapest of the strictly Northern Iron markets. It would be unreasonable to expect a further decline to correspond with the $1.50 cut made by the Thomas Iron Company. Quotations are practically unchanged, ruling about as follows for cash, f.o.b. Chicago: Local Coke Iron, No. 1, $16; No. 2, $15; No. 3, $14; Chicago and Bay View Scotch, $16.50; Lake Superior Charcoal, $19; American Scotch (Blackband), No. 1, $18 @ $18.50; Southern Coke, No. 1 Foundry, $16; No. 2 Foundry and No 1 Soft, $15.25; No. 3 Foundry, $14.75; Gray Forge and No. 2 Soft, $14.25; Tennessee Charcoal, No. 1, $19; No. 2, $18; ditto, lower grade, No. 1, $17; No. 2, $16; Alabama Car-Wheel, $25.25.

Bar-Iron.—The situation is about the same as it has been, both mill agents and jobbers reporting a very light demand. Carload lots of Common Iron are quoted at 1.60¢ @ 1.65¢, half extras, f.o.b. Chicago, while small lots from store sell at 1.75¢ @ 2¢, according to quantity and quality. The mills are trying to get an advance of $\frac{1}{10}$¢ over present prices for deliveries between the 1st of July and the 1st of October.

Structural Iron.—Very few large contracts have lately been on the market, but small orders have been so numerous that the mills are making heavy shipments this way, particularly of Beams. Carload lots from mill are quoted as follows, f.o.b. Chicago: Universal Plates, 2.15¢ @ 2.20¢; Angles, 2.10¢ @ 2.15¢; Tees, 2.50¢ @ 2.55¢; Beams and Channels, 2.90¢. Angles from store are held at 2.25¢ @ 2.30¢; Tees, 2.65¢ @ 2.70¢; Beams, 3.4¢.

Plates, Tubes, &c.—The boiler-makers are beginning to pick up orders, and have considerable business in sight, so that a better feeling prevails in this line. The Plate mills are stiffening on Iron, but are not quite so firm on Steel. The Wrought-Iron Pipe trade is quite active, and prices were advanced on Thursday. Store prices are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 57½ % off for 1¾-inch and less and 62½ % off for 2-inch and larger.

Sheet Iron.—The impression is growing that the supply of Black Sheets will hardly be equal to the demand, so many mills having already sold all they can make for the balance of the year, while inquiries continue to pour in. Common, No. 27, is quoted at 2.85¢ @ 2.90¢ at mill; guaranteed to corrugate, 15¢ per 100 lb advance. Store lots of Common, No. 27, sell at 3.10¢ @ 3.30¢, according to quality.

Galvanized Iron.—Manufacturers' agents have had a lively trade in small lots, but prices are as low as ever. Small quantities are quoted at 65 % off for Juniata and 65 % and 5 % off for Charcoal.

Merchant Steel.—The trade of the past week was very fair, including some good-sized orders for Tool Steel. No heavy contracts have come forward as yet, but the market is well sustained by the flow of small orders, and prices are about the same as they have been, viz.: Soft Steel Bars, 2.20¢ rates; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢; Sheet Steel, 7¢, 8¢ and 10¢; Tire Steel, 2.20¢ @ 2.25¢.

Steel Rails.—A very satisfactory movement is reported in small lots, ranging from 250 to 1000 tons, and originating principally in the Far West and Northwest. The demand for Light Rails has been a noticeable feature of the trade. They are wanted for mine use, for lumber roads and for the construction of feeders to main lines in sparsely settled districts. A couple of large orders are the subject of negotiation at present, and a very hopeful feeling is expressed that by June a much more active market will be experienced. An encouraging indication for the future is the successful sale of bonds by a new railroad company, who will require from 20,000 to 25,000 tons of Rails. Although this particular project lies outside of the territory reached by the Chicago mills, it is accepted as evidence that other new railroad schemes can be financed which will draw their Rail supplies from this quarter. Prices have been irregular for some time, depending upon the extent of competition from other mills, the adjustment of freight rates, &c., but a stiffer feeling now obtains among sellers, and they are endeavoring to work prices upward. The regular quotations for Standard Rails for strictly Chicago delivery are still $29.50 @ $30.

Track Supplies.—A better demand for Spikes is noted, but generally speaking the market is very quiet. Small lots are quoted as follows: Steel Fish-Plates, 1.90¢; Iron Fish-Plates, 1.75¢; Bolts with Square Nuts, 2.55¢; Bolts with Hexagon Nuts, 2.65¢; Spikes, 1.95¢ @ 2¢.

Old Rails and Wheels.—Sales of moderate quantities of Old Iron Rails at interior points are reported at $20. Holders ask the same price here, but the best bids brokers have been able to get from consumers would only equal $18.50 at Chicago. Old Car-Wheels are quiet. Quotations are nominal at $16 @ $17.

Scrap.—Small quantities of Old Material have been sold to consumers, but the bulk of the transactions now in progress consists of purchases by dealers. A little better demand for Steel Scrap than Iron is noted. Dealers quote to consumers as follows ℔ ton of 2000 lb: No. 1 Wrought, $17 @ $18; Track, $17 @ $18; Axles, $22; Horseshoes, $17; No. 1 Mill, $13.50; Cast Machinery, $12 @ $12.50; Stove Plates, $9; Cast Borings, $8; Wrought Turnings, $11.50; Axle Turnings, $12.75; Mixed Steel, $10.50 @ $11; Coil Steel, $13.50; Leaf Steel, $15.

General Hardware.—It is commonly remarked that the course of the Hardware trade this spring has been very peculiar, fluctuating widely from week to week and often from day to day. The demand has been of a spasmodic character, making business very active for a time, to be followed by decided quietness. Just now there is a little spurt of activity. Taking the entire spring, however, the volume of business is reported by the leading houses to have been about equal to that of other years. Apprehensions of drought were beginning to be felt throughout a large part of the West, but they were dispelled last week by refreshing rains, and traveling salesmen now send in most encouraging reports of trade prospects.

Nails.—Manufacturers' agents have had a fair run of inquiries for Steel Nails, and have made moderate sales, with prices ruling a fraction better for the mills than during previous weeks. Wire Nails are firmer, jobbers reporting an advance in the cost to them of at least 5¢ ℔ keg on recent purchases, and they are now instructing their salesmen to endeavor to secure better prices also. Small lots of Steel Nails are still quoted at $1.95 @ $2 and Wire Nails at $2.35 @ $2.40, with 5¢ off for mixed carloads.

Barb Wire.—Jobbers are pushing the manufacturers for more prompt deliveries on their contracts, not being able to fill orders fast enough, yet prices are as low as before, namely, $2.75 @ $2.80 for small lots of Painted and $3.35 @ $3.40 for Galvanized.

Pig-Lead.—Relative to the course of the market at the several Lead centers during the past week, Everett & Post say: "At the opening higher prices were quickly established and each day witnessed a still further stiffening of values until the middle of the week, when, for the moment, the upward movement seems to have ceased. A noticeable feature is that most of the buying has been done for speculative interests, while consumers generally are holding aloof. It is hard to give the exact cause of the recent 'boom,' but probably the chief reason is to be attributed to the Secretary of the Treasury, who has appointed the 15th inst. for the hearing of pros and cons on the Mexican Silver-Lead Ore question. Should it then be decided not to change the present ruling the metal would undoubtedly react to a much lower basis; while if, on the other hand, the Treasury Department should decide to no longer admit these Ores free of duty, then a considerably higher range of values might soon be expected. The recent upward movement has been helped along by a considerable short interest in New York and elsewhere, and also a large demand for Spot Lead; at the same time, most of the refiners are well sold up for May and June delivery and are unable to take advantage of the present advanced rates. The Chicago market, opening at 3.60¢, has kept in line with New York, and though no large sales were made values have been firm. At the close we call the market 3.75¢, with sales of some 200 tons at that."

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St. PHILADELPHIA, Pa., May 14, 1889.

Pig-Iron.—Now that things have settled down a little after the break made by the Thomas Iron Company, it is possible to take a reasonably correct view of the position. In doing so it is found that one or two brands that were selling at $17.50 for No. 1 are now available to good buyers at $17, but the majority have made no changes whatever. Those who were getting $18 are still holding for $18; those who were down to $17 before the Thomas reduction still remain at that figure and say they see no reason why they should change. A reduction in the cost of Ores, however, may induce some of these parties to shade a little on Pig-Iron, but they are not doing it at present, as there is no accumulation of good Iron, and their action will depend more on what the demand may be in the near future than on any arbitrary figure which may be named by those controlling other makes of Iron. As to the probabilities, it is pretty hard to say what may be done. Owing to the reduction in cost, as we have said, prices could be shaded without placing sellers in any worse position than they were in before, but when things are in the miserable condition that they have been in during the past six months it is improve-

ment they want, and not to be satisfied because they are no worse off. Still, there is some comfort in that, considering all the terribly bad things which have been predicted during the past few days. Apart from outside influences, it is almost certain that this market would easily develop into higher prices, but it depends on the amount of overflow from the South and West. Advices from these points are not encouraging, and it is understood that Western buyers are not willing to continue at the prices ruling during last month. It is just possible that they may have been unduly frightened at the "dollar-and-a-half drop," but whatever may be the cause, it is stated on good authority that buyers at the points named are standing out for concessions, and that business in large lots cannot be closed to-day unless at more or less of a reduction in price. This, if persisted in, leaves the Eastern market open to a further attack from the South, although at the moment there is nothing offering below last week's prices. But the law of supply and demand will assert itself, and this is what the trade are waiting for. If consumers must have Iron, prices will be sustained; if their requirements are such that they can curtail purchases, prices must decline in spite of all theories to the contrary. It is a waiting market, and at the moment it is impossible to say what the next turn may be, although much confidence is felt in better prices after midsummer. The range of prices for Philadelphia deliveries may be given as follows: Good to choice No. 1 Foundry, $17 @ $18; No. 2 do., $16 @ $16.50, and Gray Forge, $14.75 @ $15.50. Southern Irons and brands new to the market may sell at 25¢ @ 50¢ below the inside rates above named, but it depends on quantity, quality, point for delivery, terms of payment, &c. The Philadelphia Iron trade regards as the worst result of the action of the Thomas Company the establishing of a most pernicious precedent in regard to the binding character of a contract. If a contract is not binding on both sides it is no contract at all, but simply an option. A six or eight months' option on Iron is a very different thing from a contract binding on both sides, and cannot by any means be regarded as a *bona fide* sale until the price is mutually agreed upon. The hardship in this case is not on the customers of the Thomas Company, but on those who made sales in good faith at prices lower than the Thomas, and who are now frequently called upon by their customers for a similar reduction to the Thomas, which is manifestly unjust and totally at variance with correct business principles.

Blooms.—Market dull and irregular, but sales are mainly within the following range of quotations: $28 @ $28.50, at mill, for Nail Slabs; $30 @ $31 for Tank Slabs; $32.50 @ $33.50 for Shell Slabs; $35 @ $36 for Flange, and $37 @ $39 for Fire-Box; Charcoal Blooms, $52 @ $54; Run-out Anthracite, $41 @ $42.50; Scrap Blooms, $32 @ $33 ℔ "Bloom" ton of 2464 lb.

Muck-Bars.—Business has not been very active, but with something of a scarcity of good Bars prices are well sustained at $27 delivered, or $26 @ $26.50 at mill, for good-quality Bars. One or two sales of good-sized lots have been reported at $26.75 delivered.

Bar-Iron.—No improvement can be noted in this department, and prices are as low and as unsatisfactory as ever. There is a little more demand probably, but competition is as close as ever; hence the continued demoralization in prices. The approach of hot weather, &c., will doubtless do much to curtail the output, and while there may not be much improvement in the immediate future, there is little doubt that to-day's prices are about as low as will be seen during the year 1889. Prices are nominally from 1.70¢ to 1.80¢ for Best Refined Bars, but cutting in extras is so general that base prices give very little idea of actual prices.

Plate and Tank Material.—The demand is quite active, and mills are running pretty nearly to their full capacity. The volume of new business is quite on a par with the output, but it seems impossible to establish any advance in prices, although they are firmly held at the limits prevailing for some weeks past. The character of the demand is such, however, that manufacturers believe that the time is at hand when an upward movement may be started, as the demand promises to be large during the next three months, while the output cannot be increased very much, although it may be considerably decreased. Prices, therefore, are steady at about the following figures asked: 1.85¢ @ 1.95¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3¼¢; Fire-Box, 3¼¢ @ 3½¢.

Structural Material.—There is no special movement in this department, and in most respects the market is just about as it was a week ago. Mills are fairly busy on Shapes, &c., with indications of a considerably better demand in course of a few weeks. Prices about as follows: Bridge Plate, 1.95¢ @ 2.05¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

Sheet-Iron.—The demand is very satisfactory, the current product of the mills being taken almost as fast as it is turned out. Inquiries are coming in from all sources, with every indication that the demand will be large all through the season. Prices remain about as follows:

Best Refined, Nos. 14 to 20	3¢
Best Refined, Nos. 21 to 24	3.20¢
Best Refined, Nos. 25 to 26	3.40¢
Best Refined, No. 27	3.50¢
Best Refined No. 28	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3½¢
Best Soft Steel, Nos. 25 to 26	3¾¢
Best Soft Steel, No. 27	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount	65 %
Common, discount	67½ %

Steel Rails.—The market is quiet, although the feeling is somewhat firmer. The unsettled condition of affairs in Pittsburgh is a standing menace to the market, and doubtless will be a barrier to any special movement for the present. Eastern mills quote $27.50 @ $28, although it is reported that a sale of 12,000 tons has been made at $27 by one of the Western mills.

Old Rails.—Absolutely no business in this market. There are buyers at $22 for T's, but holders quote $22.50 and upward, some as high as $24.

Scrap-Iron.—There is very little change in Scrap, although consumers contend for lower prices, but the supply being small prices are fairly maintained at about the following quotations: $20 @ $21 for cargo lots; $21 @ $21.50 for carload lots, delivered, or for choice, $22; No. 2 do., $14 @ $15; Turnings, $14 @ $15; Old Steel Rails, $18 @ $19; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish-Plates, $23 @ $24; Old Car-Wheels, nominal, $17 @ $18, Philadelphia.

Wrought-Iron Pipe.—There is an increasing demand, and prices are firmer, as shown by the following discounts: Butt-Welded Black, 52½ %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 52½ %; Boiler Tubes, 60 %.

Nails.—The demand has fallen off somewhat, although the movement is still considerable. Prices are nominally unchanged, but extremely low figures are mentioned in the case of sales to realize cash. Standard brands command about $1.80 @ $1.85 in carload lots, and $1.90 @ $2 from store.

Jas. G. Lindsay & Co., Bullitt Building, Philadelphia, are now the representatives of the Duquesne Forge Company (formerly Miller Forge), Pittsburgh, Pa.; also the general agents for the Garry Iron Roofing Company, of Cleveland, Ohio.

Cleveland.

CLEVELAND, May 13, 1889.

Iron Ore.—The best authorities agree that the total sales of Lake Superior Ore to date amount to not less than 3,250,000 tons, almost a million tons of Ore having been sold during the past week. Included in the heavy orders placed during the past six days were several round lots of No. 1 Specular and Magnetic Ore, non-Bessemer quality, at $4.75 @ $5, Cleveland delivery; a substantial amount of Gogebic Bessemer Ore at $5; considerable Bessemer Ore from the Menominee Range at $4.90 @ $5.10 and a large number of orders for Non-Bessemer Hematites at about $3.75, f.o.b. vessels, Cleveland, Ashtabula and Buffalo. The market is certainly active and the amount of Ore sold during the week just closed closely approximates a million tons. Every mining company represented in this city reports heavy orders at about the same quotations furnished *The Iron Age* last week. Ore is being pushed down from Ashland, Two Harbors, Marquette and Escanaba at a tremendous rate, 22 vessel-loads arriving yesterday and the total receipts of the past seven days aggregating not less than 60,000 tons. The mine owners are experiencing no trouble in engaging plenty of tonnage at 90¢ from Escanaba, $1.10 from Marquette and $1.25 from Ashland and Two Harbors. The heavy buyers at Pittsburgh have thus far made only scattering purchases, but the Ore men profess to be indifferent to this situation, claiming that they are having all the orders their clerks can place on the books, and that the present prices for Ore will unquestionably be the season's quotations. This claim may be subject to doubt from the fact that in July and August of 1888 the market declined from 25¢ to 40¢ ℔ ton upon all grades of Ore, and something equally favorable to the purchasers may occur this year. Furnacemen argue that this is likely to come about, because of the comatose condition of the Pig-Iron market, and because, too, lake freights are much more favorable to shippers than was the case last year. Representatives of the very highest grades of Bessemer Ores claim additional sales amounting to 12,000 or 15,000 tons at $6.25, Cleveland delivery, and of Minnesota Bessemers at $5.75. The following are the quotations, f.o.b. vessels, Lake Erie ports:

Specular and Magnetic Bessemer Ores	$5.75 @ $6.25
Specular and Magnetic Non-Bessemer Ores	4.50 @ 5.00
Red Hematite Bessemer Ores	@ 5.00
Red Hematite Non-Bessemer Ores	3.50 @ 4.00
Menominee Range Bessemer Ores	4.90 @ 5.10
Menominee Range Non-Bessemer Ores	3.50 @ 4.00
Gogebic Range Bessemer Ores	4.90 @ 5.25

Pig-Iron.—Dealers are encouraged by the increased demand for Wire-Rods, necessitating, of course, an improvement in the inquiry for Blooms and Billets. The market certainly retains the hopeful features of last week, a result due in some degree to the existing demand for Bessemer Iron, at which an offer of $16 for 10,000 tons at the furnace was refused during the week just closed. Prices for Iron are rigorously

guarded, but that a considerable quantity is being sold is evident from the reports of the amount of Iron going into consumption, and also to the fact that there is little or no accumulation of stocks at the yards. The following are the quotations:

Nos. 1 to 6 Lake Superior Charcoal	$20.00 @ $21.00
No. 1 Strong Foundry, Bessemer quality, ₽ ton	16.50 @ 17.00
No. 1 Strong Foundry, ₽ ton	16.00 @ 17.00
No. 2 Strong Foundry, ₽ ton	15.00 @ 16.00
No. 1 American Scotch, ₽ ton	16.50 @ 17.00
No. 2 American Scotch, ₽ ton	15.50 @ 16.50
No. 1 Soft Silvery, ₽ ton	17.00 @ 18.00
Mahoning and Shenango Valley Neutral Mill Irons, ₽ ton	14.00 @ 15.00
Mahoning and Shenango Valley Red Short Mills, ₽ ton	14.50 @ 15.50

Old Rails.—Old Americans are still weak at about $20.50 @ $21, and with only a few scattering sales reported. Old Wheels are to be had in plenty almost at buyers' prices.

St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st., ST. LOUIS, May 13, 1889.

Pig-Iron.—For some reason business holds off. Orders are scarce and when placed are generally for small lots. This city is amply supplied with Pig-Iron agents and the competition to secure what little business there is is consequently very active, and naturally prices are shaded to secure trade, and agents appear willing to concede part of their commission to secure some business for the furnaces they represent. This is a feature that just at the present time is particularly objectionable. If the agents would be satisfied to name a fair price and abide by it, taking their regular commission, it would be far more advisable than following the course they are at present pursuing, especially so just at this time, as the market is certainly in a very depressed condition, although there appears to be considerable confidence as to the future; in fact, more than the actual condition of things seems to warrant. During the week some few sales were entered, in 200 and 300 ton lots, made up of different grades. Under the circumstances prices are holding very well, and notwithstanding the dullness prices seem to be held with some degree of strength. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$15.50 @ $16.00
Southern Coke, No. 2 Foundry,	15.00 @ 15.25
Southern Coke, No. 3 Foundry,	14.50 @ 14.75
Gray Forge	13.50 @ 14.00
Ohio Softeners	17.00 @ 19.00
Lake Superior Charcoal	20.50 @ 21.50
Missouri.	
Charcoal Foundry, No. 1	16.00 @ 16.50
Charcoal Foundry, No. 2	15.00 @ 15.50
Tennessee.	
Charcoal Foundry, No. 1	17.00 @ 18.00
Charcoal Foundry, No. 2	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, $4.55; St. Louis, $4.70.

Bar-Iron.—The improvement noted last week continues, and it now looks as if some advance in prices will be made shortly, as it is reported that the mills which were known to be cutting prices are about filled up with orders, and the stronger concerns who held off and only took what business as was actually necessary are in the market to sell, but not at the extreme quotations that prevailed during the first three months of the year. Small lots from store are quoted at $1.80, and carload lots from $1.60 to $1.70, according to circumstances.

Barb Wire.—There is an active demand for Wire, and prices show more strength. The prospect of any combination among the manufacturers seems to be as distant as ever, as it is understood that there are two or more concerns that will not enter the combination under any circumstances. But aside from the combination there seems to be some prospect of improvement in prices, but how soon it is difficult to tell. There is a growing disposition among manufacturers to discontinue taking orders to be delivered, and if possible sell all goods f.o.b. St. Louis. If this could be accomplished it would prove quite a saving to the manufacturers, as they are compelled to pay freight on the wooden spools, which is a complete loss to them. One manufacturer during the past week refused a carload order on account of this feature. Whether the other manufacturers will take the same stand remains to be seen. Mills quote from $2.80 to $2.85 for Painted and from $3.40 to $3.45 for Galvanized. Carload lots are quoted at from $2.70 to $2.75 for Painted and $3.30 to $3.35 for Galvanized, f.o.b. St. Louis.

Continental Wire Company have removed their office from 409 North Third street to Laclede Building.

Wolfe & Good, manufacturers' agents, have removed their office from 411 North Third street to Laclede Building.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, May 13, 1889.

A tour among the local Iron agents and factors was but lightly rewarded to-day, the general report for the week being small sales and unsatisfactory prices. Traveling men from the South bring more discouraging facts than reassuring news, from Alabama at least. The foundries in that section are selling at ruinously low prices; others are looking for more favorable localities. In the North, parties who have made large contracts in some instances are asking a postponement of deliveries, reflecting a falling off or a cancellation of orders. Rolling-mills are especially dull. On the other hand, Pipe-works continue to melt heavily, and some Car-works in the West have been fortunate in securing larger contracts, on the strength of which Cincinnati has been enabled to sell 800 tons Lake Superior Car-Wheel Iron on a basis of $20.25, cash, here, but this is the only sale of moment recorded. At the moment bids are in for 1500 to 2000 tons No. 3 Foundry and Gray Forge, and the award will probably be made to-day or to-morrow. The open prices quoted for Gray Forge and No. 3 Foundry are $13 and $13.25 respectively, and the inference is that these prices can be shaded 25¢ on such a market. Even the run of small orders is becoming lighter.

Manufactured Iron.—The rainfall during the past few days has much improved the agricultural outlook in this section, but more moisture is necessary to restore the crops to a normal condition. In the North and West rain has been ample. It is only in the Central West that there has been much apprehension. General business has not yet received the stimulus anticipated, and orders for Manufactured Iron reflect dullness more than any other condition, and an easy tone prevails. The following are the approximate prices current here at the close, for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1 (new classification)	$14.75 @ $15.25
Southern Coke, No. 2 (new classification)	14.00 @ 14.50
Southern Coke, No. 3 (new classification)	13.25 @ 13.75
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 15.25
Mahoning and Shenango Valley	16.00 @ 16.50
Hanging Rock Charcoal, No. 1	20.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 1	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 2	16.50 @ 17.00
Forge.	
Strong Neutral Coke	12.75 @ 13.00
Mottled Neutral Coke	11.75 @ 12.00
Gray Forge	12.75 @ 13.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 24.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.00 @ 21.00

Nails.—There has been a fair order trade and a steady market for all kinds; 12d @ 40d sell at $1.90 @ $1.95 ₽ keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at $1.90 @ $1.95, and Steel Wire Nails at $2.45 @ $2.50 ₽ keg.

Old Material.—There has been an improved demand for Old Rails at $20 cash, but holders have refused to sell under $21. Old Wheels have been neglected and prices have remained nominal at $18, spot cash, here.

W. H. D. Totten, Jr., the Western representative of Messrs. Carnegie, Phipps & Co., of Pittsburgh, Pa., has secured quarters in the Michell Building, adjoining the new Chamber of Commerce. Mr. Totten, although representing the firm mentioned but a few months in Cincinnati, has succeeded in building up a very satisfactory trade for the productions of the company.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, May 13, 1889.

Pig-Iron.—The market continues in about the same quiet condition that has prevailed for the past two or three months. The cut of the Thomas Iron Company, so far as can be ascertained, has not created even a ripple in prices. It certainly has not affected prices, as small round lots are now being sold to go to the Eastern markets at about the same prices that prevailed before the announcement. Taking the whole condition of the market into consideration, prices have receded but very little during the last month. Good grades of favorite and well-known brands are as closely sold up as the furnaces care to go, and the constant demand and inquiries go to show that these special Irons will continue to find a market. Grades that are a little off, or not as well known, are of course being sold at conceded prices. Iron producers are now taking no other position than that the market is down as low as it will get any time in the future, and are simply holding on for something to "turn up," or some other turn. Some say that they are making some money, which is probably so; others say they are losing nothing, which may also be true, and under this condition of things all will keep running on. Under a freight rate of $3.75 from this, as well as the Birmingham district, they still claim the New York and Philadelphia markets. At the same time, the enormous retail trade, as it were, from every consuming point in the United States keeps the prices that they are getting for their output up to something more than what their Eastern markets net them. Large quantities of Nos. 3 and 4, mixed with a little No. 1, are now being used by some of the largest consumers, so that the yards are now well cleared up in those qualities, which leaves the bulk of the Nos. 1 and 2 for the open markets East and to special customers. So far as can be ascertained, none of the furnaces are suffering for orders, and there are a great many offers a little under that are declined.

Louisville.

LOUISVILLE, KY., May 13, 1889.

Pig-Iron.—The market has been very quiet during the past week, purchasers buying in small lots and to meet their immediate necessities rather than for future delivery. A disposition is being shown among a few to buy for deliveries extending throughout the year. Consumers are

recognizing that the price of Iron is extremely low, but are not willing to contract for large amounts until they see the effect of the drop in prices in the Eastern market. It is not felt, however, that there will be any special change in prices among Southern furnaces in this section owing to the action of the Thomas Iron Company, as the drop has been discounted for some time. We quote as follows:

Southern Coke, No. 1 Foundry, new classification	$14.75 @ $15.25
Southern Coke, No. 2 Foundry, new classification	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification	13.75 @ 14.25
Gray Forge	13.25 @ 13.75
White and Mottled, different grades	12.75 @ 13.25
Silver Gray, different grades	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry	16.25 @ 16.75
" " No. 1 Mill	14.75 @ 15.25
Southern Car-Wheel, standard brands	21.75 @ 22.75
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry	19.50 @ 21.00
Hanging Rock, Cold Blast	20.75 @ 22.75

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.
PITTSBURGH, May 14, 1889.

The general Iron situation remains in much the same condition noted a week ago; in some respects the outlook is favorable, while in others it is not. There is a large volume of business, but prices continue unsettled and unremunerative. Nearly all our mills and furnaces are in operation, but there is very little money in the business at the present time. While consumption is increasing, production continues in the lead.

The strike at the Rail mill of the Allegheny Bessemer Company, at Duquesne, continues, although it is claimed that it is about over, the mills in operation being operated by non-union men, but, the strikers say, with very poor results. However, as stated in this column a few weeks ago, it is the evident intention of the company to make it a non-union mill; and it looks now as if they would be successful. Some of the strikers, it is said, have left the place, which may, if true, be taken as an indication that the back of the strike is about broken.

Mr. Andrew Carnegie, who was here a few days, was interviewed again in regard to his status toward the Pennsylvania Railroad and its discriminations against Pittsburgh. Among other things, Mr. Carnegie said: "I make this prediction, that what we have asked will be granted soon; some of it very soon. First, Ores will be carried from the lakes to Pittsburgh as cheaply as from the lakes to the Ohio furnaces, the distance to the latter being greater than the former. This is the most vital change of all. Second, Coke will be supplied to the furnaces in the Pittsburgh district at the same rates as the Pennsylvania Company receive upon Coke carried to Pittsburgh destined for Chicago furnaces. Third, rates upon all classes of freights, east and west, say to Baltimore, Philadelphia, New York and Eastern cities, and to Chicago and Western cities, will be just one-half of the through rate between Eastern and Western cities. With these fair requests granted I think that every manufacturer in Pittsburgh will change position in regard to the railroads. They will recognize them as their allies and friends and be only too glad to cooperate with them. There may be other equally wrong discriminations in other branches of business of which I have no knowledge."

Word comes from Washington that John Jarrett, a former president of the Amalgamated Association, and Wm. Martin, at present secretary of the same, are to receive consular appointments. The appointments if made will be a source of great satisfaction here to people generally, but to members of the Amalgamated Association in particular. Both men stand high in this community.

Pig-Iron.—There has been an increased volume of business the past week, and just as soon as consumers can satisfy themselves that hard-pan has been touched the demand will be largely increased and the result a stronger market. Consumers generally are low in stock, as they have been buying from hand-to-mouth for some time past, and as soon as the feeling begins to obtain that the lowest notch has been touched all will want to buy, which will be immediately followed by sellers refusing to sell, and up will go prices. Pig-Iron, it is said, with but a single exception, never sold lower than it is at present, and the situation warrants the prediction that there will be an increased demand and a reduced production within the next few weeks. There is no margin for profit at present prices, while the cost of production has been reduced to the lowest possible limit, and a number of furnaces will go out as soon as they get through with existing contracts. We quote prices as follows:

Gray Forge Neutral	13.75 @ $14.00,	cash
White and Mottled	13.00 @ 13.50,	"
All-Ore Mill	14.75 @ 15.25,	"
No. 1 Foundry	16.00 @ 16.50,	"
No. 2 Foundry	15.00 @ 15.50,	"
No. 3 Foundry	14.50 @ 14.75,	"
No. 2 Charcoal Foundry	21.50 @ 22.00,	4 mon.
Cold Blast Charcoal	24.00 @ 27.00,	cash
Bessemer Iron	16.00 @ 16.25,	"

Sales of several thousand tons Neutral Gray Forge reported at $13.95 @ $14, cash, and $14.25, four months; 2200 tons Bessemer at $16, cash, which is now the ruling price.

Muck Bar.—So far as we can learn there have been no sales below $26, cash, at which it is offered pretty freely. Offers were made last week to buy at $25.50 @ $25.75, cash, but no sellers could be found.

Spiegel—Is still quoted at $30 @ $30.50, cash, for 20 %. Sale, 300 tons Ferromanganese, 80 %, at $58, cash, and a smaller lot, 77½ %, at $57.50, cash.

Manufactured Iron.—The Merchant-Iron trade is more active, but prices continue unsettled and unsatisfactory. We continue to quote upon a basis of 1.60¢ @ 1.70¢ for Bars for first-quality Iron, 60 days, 2 % off for cash. Old-Rail Iron is being offered by mills in Mahoning and Shenango valleys at 1.40¢ @ 1.50¢ rates. There is an increasing demand for Skelp-Iron, and some of the mills not only have all they can do for the present, but are sold up until July. No change in prices—Grooved, 1.62½¢ @ 1.65¢; Sheared, 1.90¢ @ 1.95¢.

Nails.—There is no change in the position of the market here; trade continues very dull, with but little prospect, apparently, of any immediate movement. We continue to quote Cut Nails at $1.85 @ $1.90, 60 days, 2 % off for cash, and Wire Nails at $2.15 @ $2.20, same terms.

Wrought-Iron Pipe.—An important meeting of the Wrought-Iron Pipe Association took place in New York on Thursday last. The attendance was large, proceedings harmonious, and all the mills in the country are now members of the association. It was ascertained that all the mills are busy, some of them contracted for several months ahead, and the indications point to an active trade until the advent of the winter season. Prices were advanced, or, what amounts to the same, discounts were reduced. The new discounts are as follows: On Black Butt-Welded Pipe, 52½ %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 52½ %; BoilerTubes, 1¾ inches and smaller, 57½ %; 2 inches and larger, 62½ %; 5⅝ inch casing, 62½ %; other sizes, 60 %; 2-inch Tubing, 13¢ per foot net; 3-inch Line Pipe, 20¢ per foot net; 6-inch do, 56¢; 8-inch do 90¢.

Old Rails.—Old Iron Rails continue dull, and prices are weak and drooping; offerings at $22 with no demand. We are advised of a sale of 1000 tons for delivery at Youngstown at $21.50. Old Steel Rails continue in demand with but few offering; short lengths are quoted at $17 @ $17.25, and long lengths at $19 @ $19.50. It is not long since Old Steel Rails were almost unsaleable, while Old Iron Rails were wanted on all sides; now it is the other way.

Steel Rails.—Manufacturers still quote heavy sections at $26 @ $27, cash, at mill, but it is rumored that orders have been booked below the lowest price quoted. The strike at the mill of the Allegheny Bessemer Company is still in progress, but the company now entertain but little doubt of ultimate success—that is, of making it a non-union mill, which is the main point in the contest.

Railway Track Supplies.—There is no change in prices. Spikes, 2¢, 30 days, Splice Bars, 1.60¢ @ 1.70¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Blooms, Billets, &c.—Bessemer Steel Billets and Blooms are quoted at $27 @ $27.25, cash; do. Nail Slabs $26.50. Sale of 1000 tons Rail Crops at $17.25, cash.

Old Material—Continues very dull, and there is so little doing that it is difficult to quote reliable quotations. We hear of sales of No. 1 Wrought Scrap at $18 @ $18.50, net ton; Wrought Turnings, $12.50 @ $13; Old Car Axles, $24 @ $25; Cast Scrap, $14 @ $15.50, gross; Old Car-Wheels, $18 @ $18 50.

New York.

Office of *The Iron Age*, 66 and 68 Duane street.
NEW YORK, May 15, 1889.

American Pig.—The Thomas Iron Company report that, as the result of their recent circular, their customers are taking Iron more freely, so that their accumulated sold stock, larger than it was ever before, is likely to be rapidly reduced, especially since additional sales have been made to customers, and some Iron is being sold to outsiders at $17 for No. 1 and $16 for No. 2, respectively. There has been some readjustment in contracts made by other sellers. It is well known, too, that some business was closed earlier in the year on the basis of "$1 below Thomas," which is now less favorable to the furnaces who entered into it. Some of the other Lehigh furnaces have issued circulars quoting $17 for No. 1 and $16 for No. 2, while Southern Iron continues to sell at $16 @ $16.25 for No. 1 and $15 @ $15.25 for No. 1, with rumors of a slight shading of the lower figures, which cannot, however, be traced to any authentic source and should be received with caution. Some of the leading Southern makers who are longer identified with the business are inclined to regard the step of Thomas Iron Company with favor, stating that their worst competitors are not the Northern furnaces, but the new plants in some sections of the South. The most interesting question which has arisen is the effect of the lower prices for Lehigh Irons in New England. Taking Boston for instance, it costs Lehigh and Schuylkill furnaces about $1.25 to go from New York to Boston. Southern furnaces can get into that port for about 25¢ more than they go for into New York. But as soon as the Iron goes inland they must pay in addition 35¢ for the haul on the belt-line to the cars. The further inland they must go the easier it is for the Northern furnaces to meet them,

especially if, as is probable, the railroads take off the recent addition to freights. Some New England harbors for instance, Portland and Bangor, Me., can be reached by Northern furnaces for $1.35 over tidewater prices. To Southern furnaces it costs about $1.50 more. During the past week a lowering of Ore and Coke freights to Eastern Pennsylvania furnaces has been granted, and Anthracite Coal is also to be reduced. We may note the fact that off-grades of Northern Irons are being crowded on the market lately and that prices are lower. We hear of business at $14.50 on Forge at tide and $15 on Plain No. 2, with a report of $13.50 on a small lot of off-grade Forge.

Scotch Iron.—The market is very dull, with Coltness nominally $21.50 @ $21.75; Summerlee, $21.25 @ $21.50, and Dalmellington, $20.25 @ $20.50. American Scotch is selling at $19, and is gaining in favor.

Structural Iron and Steel.—The contracts for the Ironwork for two office buildings on Wall street were placed during the week, the aggregate quantity of Beams being about 800 tons. We continue to quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

Plates.—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

Steel Rails.—The conference of Railmakers did not result in anything that is tangible. As one leading manufacturer put it, "they walked up the hill and walked down again." It was understood that a number of the Eastern mills were in favor of the adoption of some method to fix a price more remunerative than that ruling at present. So far as we are informed, however, no definite arrangement ever came up for discussion. It is stated that the representative of the Pittsburgh mill held that with an active competitor, not one of the association, in his own territory anything which approached an agreement to fix a price is altogether out of the question. The first signs appeared this week of the usual newspaper bear campaign which annually precedes the entrance into the market of a leading railroad interest in the Southwest. Until the great magnate alluded to has purchased all sorts of rumors of low prices are likely to be kept afloat with much ingenuity, but they are not likely to have much effect. We class among them the story which cropped up in Philadelphia that Rails had been sold at $24.75. So far as we have been able to learn $26 has been shaded only once by any mill East or West during the past two months, all the talk by outsiders and rival Railmakers to the contrary notwithstanding. Eastern mills report business, scattered from Maine to the Gulf, of an aggregate of 13,000 tons at $26.50 @ $27. In the West only one small transaction, an addition to a larger order placed with a Pittsburgh mill lately, is reported. Prices there are still $26. Dividing the mills in the association into three groups, the Eastern with the Troy, Scranton, Lackawanna, Pennsylvania and Bethlehem; the Central with Edgar Thomson, Cambria and Cleveland, and the Western with North Chicago, Juliet, Union and Springfield, the report of the Board of Control shows the following for the first four months:

Group.	Sales.	Allotment.
Eastern	300,995	383,537
Central	222,548	281,260
Western	226,521	288,306
Total	750,064	.....

The total allotment, which includes one mill not enumerated in the above, is 990,850. It should be noticed, however, that the total sales reported, 750,064, do not, of course, include the Allegheny Bessemer Company, whose sales aggregate at least 50,000 tons. Nor does it, of course, include the sales made since May 1. It is estimated by good authority that this will swell the total to 850,000 tons, at least. On May 1, 1888, the sales had been about 721,000, while at the same date in 1887 they aggregated 1,598,048 tons. The shipments from the mills up to May 1 were 343,044 tons in 1889, against 299,556 tons in 1888, and 564,403 tons in 1887. It may be of interest to add that there is an inquiry in the market for 40,000 tons of Rails for an extension into Oklahoma of the Chicago, Kansas and Nebraska Railroad.

Bar-Iron.—The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

Scrap-Iron.—Business appears to be at a stand-still, except in very small lots, sellers showing a disposition to stack material rather than sell at the prices offered. We quote: No. 1 Scrap, $20 @ $20.50 for cargo lots, and $20.50 @ $21 for carload lots, delivered; Turnings, $13.50 @ $14; Cast Scrap, $15 @ $16; Borings, $9.50 @ $10.

Old Rails.—These are dull and nominal at $22 @ $22.50. No business of any consequence is reported.

Fastenings.—Spikes in large lines may be quoted $1.90 @ $2 and Angles $1.70 @ $1.80, Iron or Steel, delivered.

Naylor & Co., of 99 John street, New York, the Bullitt Building, Philadelphia, and Lewis Block, Pittsburgh, announce that they have made arrangements to supply with Ore Isaac McHose & Sons, of Norristown, Pa., and to take the sale of the special low phosphorus Pig-Iron known as Acme, which is guaranteed phosphorus not to exceed 0.03, sulphur not exceeding 0.03, and silicon 1 to 2 per cent. Isaac McHose & Co. publish daily determinations of phosphorus of the Acme for April, which shows a maximum on only two days of 0.028 phosphorus, the lowest being 0.022. They expect to make a limited quantity which they can guarantee 0.02 and under in phosphorus, which they call Special Acme.

Wetherell Bros., Steel merchants, agents of the La Belle Works, of Pittsburgh, and the Carlisle Works, of Sheffield, England, have moved their New York office to 93 Liberty street.

Financial.

The course of events affecting trade, taken as a whole, is pronounced favorable, the drawbacks being only occasional. Confidence in the future seems to be well grounded. The fact is construed favorably that despite considerable exports of gold in face of a low bank reserve no uneasiness was occasioned. A depletion of money might be reasonably welcomed, rather than an accumulation that stimulates reckless speculation. Favorable conditions are reported from various sections of the country, particularly as to crop prospects. According to the Bureau reports the condition of wheat presents not merely the best May average for seven years, but surpasses the May condition in 1884, when the yield was the largest ever reported. For Dakota and Minnesota alone, we are told, the recent rains would be "cheap at $1,000,000." The season in Texas is said to be at least one month in advance of previous years, and the outlook for crops was never more promising. It is also stated that the assurance of more stability in railroad tariffs, resulting from the salutary operation of the Interstate Commerce law, is hightened in effect by better railroad earnings. Among other influences are the decrease in iron production, a reduction of 10 cents in tolls on bituminous coal and 20 cents on iron ore from Lake ports and the opening of a new line from New York to Chicago. Corn is more active. Wheat is firmly held, spot cotton is steady, provisions are dull and weak under large receipts. Prices of staple dry goods rule firm all around, and in the case of print cloths are raised 1.16¢.

On the Stock Exchange the volume of business is small, and there is little activity beyond a few leading specialties. Atchison, St. Paul and Oregon Transcontinental have been most conspicuous. The contest for the control of Oregon excited much interest. Richmond Terminal was strong in face of the proposed issue of stock. On Tuesday the tendency of prices seemed to be downward. Atchison continued to reflect a growing confidence. appointment of a receiver for the St. Louis, Arkansas and Texas had little effect. The undertone was strong until the final dealings, when the whole list fell off and the market was heavy.

United States bonds were quoted as follows:

U. S. 4½s, 1891, registered	106¾
U. S. 4½s, 1891, coupon	107¾
U. S. 4s, 1907, registered	129⅜
U. S. 4s, 1907, coupon	129⅜
U. S. currency 6s	121½

The total bond purchases from August 3, 1887, to date have been $167,459,900, of which $61,587,250 were 4 per cents and $103,862,650 were 4½ per cents. Their cost was $193,574,784, of which $78,925,014 was paid for the 4 per cents and $114,649,770 was paid for the 4½ per cents. They would have cost at maturity $229,124,951.

The total bank clearances last week in 40 cities show an increase of 13.3 % over the corresponding period last year. Outside of New York the clearances are increased 11.6 %.

The weekly statement of the associated banks shows a loss of $672,000 in surplus reserve, which was unexpectedly favorable, considering the recent heavy specie shipments. The surplus reserve now held amounts to $8,821,135. Against a loss of $3,204,900 in specie there was a gain of $2,675,100 in legal tenders, resulting from the influx of currency from the interior. In loans there was a contraction of $905,500. The money market has ruled fairly easy during the week, but for time loans there was a firmer feeling, and there was little disposition on the part of lenders to make engagements maturing after September except at an advance. The demand for commercial paper is urgent in the absence of opportunities for profitable investment. Quotations for indorsed bills are 3½ % @ 4 % 60 @ 90 days, and first-class commission-house names are 4 % @ 4½ % four months. The counting of $178,394,763.45 in cash in the vaults of the Sub-Treasury was completed and the amount found to be correct. H. B. Collins & Co., the bankers, of this city, control the entire capital stock of the two gas companies doing business in St. Louis. It is said that the purchase amounted to $8,500,000. The Spanish-American Commercial Union have leased permanent quarters in the Manhattan Bank Building, in Wall street. Exports of specie for the week were $808,000 and of merchandise $6,919,000, the latter including 230,500 bushels of wheat, 545,000 bushels of corn and 28,427 bales of cotton. Importations amounted to $10,207,000.

The market for sterling was steady, with no features of interest. Bankers were divided in opinion as to whether any important shipments of gold to Europe are likely to be made this week. Posted rates

closed at 4.88 for 60 days and 4.89½ for demand. On the Paris Bourse last week Credit Foncier shares fell 10 francs; Rio Tintos declined 11 francs; Comptoir d'Escompte shares lost 12 francs The Rothschilds arranged for a Russian conversion loan for $240,000,000.

The imports at New York during April amounted to $40,599,237, a gain of $1,200,000 on the corresponding month last year, but the demand for foreign products was not sufficient to impart much animation to the market. In a survey of the previous 18 years it appears that there were five corresponding months when the receipts of foreign merchandise were larger. For four months the imports make a total of $168,550,700, as compared with $161,305,700 in the same time last year, and for ten months the total, including specie, is $387,589,000, against $385,066,000 for ten months ending April 30, 1888. The total exports for ten months of the fiscal year are $313,045,000, an increase of about $31,000,000 compared with the previous year, figures which are encouraging but look meager compared with 1881, when shipments of produce and merchandise alone were $75,000,000 in excess of the current year.

The Bureau of Statistics reports total exports of breadstuffs during April to have been $9,537,876, an increase of about $1,500,000 over those for April, 1888. Of these the exports of corn were $3,750,291, an increase of nearly $3,000,000; of wheat $2,534,032, a decrease of about $100,000, and of wheat flour $3,135,547, a decrease of $1,300,000. For the ten months of the fiscal year the exports of breadstuffs were $101,282,823, as compared with $110,028,536 for the corresponding ten months of 1888. The exports of cotton for April were $15,880,910, about $2,500,000 more than for April, 1888. The exports of mineral oils were $3,641,490, about $400,000 more than April, 1888. The total exports of beef and hog products for April amounted in value to $8,388,602—an increase of about $1,500,000 over April, 1888. The total exports of dairy products were valued at $420,021—an increase of about $100,000.

Coal Market.

The outlook for Anthracite Coal is not as cheering as the trade might desire, on account of the plethora of stock as compared with demands, and this despite the persistent efforts to keep production within the prescribed limits. Still, there is claimed to be some improvement. Intimations are thrown out that at the next meeting of sales agents in this city, 22d inst., "an advance" in tidewater prices will be announced, but it is elsewhere assumed that this does not necessarily follow; that really the design is simply to stiffen the schedule. The Eastern demand is satisfactory, while in the Western trade stagnation is the feature.

The Pig-Iron manufacturers have addressed a letter to the most prominent furnacemen to secure a reduction of the freight rate on Coke. The Philadelphia *Press* of Wednesday says: "The price of Coke is now $1 ℔ ton, while the freight to the Eastern furnaces is about $2.25 ℔ ton. The price of Anthracite Coal is just double the price of freight. This the furnacemen say is not just and that a considerable reduction should be made in the freight on Coke. It was reported that the Southern furnaces could manufacture Iron for $10.50 per ton, and paying full freight they could ship it North and sell it for $14.50, thus making from $1 to $1.50 on every ton. To compete with them something must be done and done quickly, and the first thing is the reduction in Coke. At the Reading's office it was said that a number of furnacemen had been to see them, and they had proffered them their support. If the other companies would act they would willingly make a concession." The Philadelphia *Ledger* says: "Several of the larger mining and carrying corporations, as well as a number of individual operators, are reported to have sold their output of Coal for the entire month of May at about the actual selling quotations which were ruling in the later part of April, and consequently they are now asking higher prices." The scarcity of vessels and consequent advanced rates of freight operate to retard shipments. The output of Coal reported for the week ending May 11 is 584,427 tons, an increase of about 96,000 tons compared with the previous week. Since January 1, the total is 10,062,000 tons, a decrease of about 1,602,000 tons compared with the same time in 1888.

The following from a Philadelphia paper excited much comment in the trade: "The Reading Railroad Company have their surveyors out locating a line from Loftus to run into the heart of the Lehigh Valley Coal region. Ever since the Lehigh Valley Railroad Company built an extension to Pottsville the Reading Company have been trying to get even with them, and by building this new road they expect to get control of a great deal of their rival's Coal tonnage. A large number of the Coal mines in the Lehigh Valley are owned by the Lehigh Valley Railroad Company and operated by them. They also have leased out a number of mines to individual operators, but with the promise that they ship all the Coal mined over the Lehigh Valley Railroad. Besides these mines owned and controlled by the Lehigh Valley there are a number of operators who can ship their Coal as they please, and it is said that these operators have been soliciting the Reading people to make the extension. Among the principal operators who want to ship their Coal over the new road are: Coxe Bros. & Co., the Pardees, J. S. Wentz & Co., W. T. Carter & Co., the Silver Brook Coal Company, Linderman, Skeer & Co., and M. M. S. Kemmerer."

A. Pardee & Co.'s breaker at Hazleton was destroyed by fire 9th inst. The fire originated in the boiler-room. Loss, $50,000. Rebuilding will commence at once.

Bituminous Coal is plenty and inferior grades are cheap. The output of Cumberland for the week was 57,071 tons; Clearfield, 67,560 tons; Beech Creek and Pocahontas each nearly 38,000 tons.

The Philadelphia and Reading and the Pennsylvania railroads have reduced the rates on Bituminous Coal from the Beech Creek and Clearfield regions to $1.70 for tidewater shipment. The Baltimore and Ohio reduced their rate on Cumberland Coal to $2 per ton.

Metal Market.

Copper.—Conferences among the representatives of the Copper mining companies were held in this city during the past few days, with the object of arriving at some arrangement. On the 16th the two months expire during which deliveries to the syndicate were to be stopped, the agreement in question ostensibly making it impossible to fix a price. It is generally understood, however, that the mines have been supplying customers, with the understanding that a rebate would be given to them equal to the difference between 16¼¢ and the price ultimately to be fixed on all Copper delivered during the interval. It is probable that the mining companies will make an effort to place the price as high as they dare go, even at some risk, in order to make the rebates on former business as small as possible. They argue that after all the manufacturer has little cause for growling, since it is altogether unlikely that he has given his customers the benefit of it or will do so now. The meeting on Tuesday appears to have been devoted exclusively to the discussion of the European situation. All the representatives are pledged to secrecy, but it is understood that the proposition before the meeting was the following: The bankers holding syndicate Copper in this country are to transfer the whole of the stock to the other side and agree to maintain the market at £45, G. M. B., distributing the disposal of their holdings over five years. In consideration thereof the American miners agree not to export as much Copper by 20 % as they did in 1888, when the shipments aggregated about 75,000,000 lb. In other words, a policy of mutual noninterference is to be adopted. It should be stated, however, that thus far this plan has not been adopted so far as known, nor do the utterances of Mr. Haggin on his arrival give much hope of it. To-day the American companies held a second meeting, at which the home situation was discussed. Obviously any success in maintaining a fixed price must be contingent upon an arrangement with foreign holders. It has been urged that 13¢ be made the price, but the general opinion seems to be that 12¢ will be the figure. In fact, Lake for June delivery has been offered to manufacturers at 12 cents. It is possible that some compromise measure, paying a rebate of 3½ cents for the copper delivered during the last two months, will be arranged. The manufacturers will certainly be slow to contract for any length of time for any quantities at any price fixed upon by agreement. They have not got any faith in the whole undertaking and will act accordingly. For May and possibly June they must and will buy literally, but they will let other people carry stock and will keep the quantity of metal in their mills down to the lowest notch. As a speculation 12¢ copper is certainly not a tempting commodity. Casting brands have meanwhile been sold at 11½¢ @ to 11¾¢. London gave way from £39. 15/ to £39 yesterday since our last report, with but little doing.

Tin.—London has been quite active and a little higher; opening at £91, spot, a week ago, it closed yesterday at £91. 2/6, while futures improved from £91. 15/ to £92; sales 1000 tons, all told. In this market 10 tons May were at first placed at 20.60¢, subsequently 80 tons at 20¢ @ 20.25¢, and 30 at 20.70¢ @ 20.75¢; 40 June at 20.40¢ @ 20.60¢, and 25 tons August at 20.65¢, in accordance with the momentary London fluctuations, which somewhat unsettled the market. Messrs. Gilfillan, Wood & Co., Singapore, in their report of April 9, remark: "The supply during the next six weeks will be on a reduced scale, and it is estimated that the year's production will not be over the average." The closing quotation for Tin on the spot is 20¾¢ @ 21¢. *Tin-Plates*—Have been quiet and unaltered, both here and in Liverpool. During the first quarter the total shipments from England were 110,017 tons, against 87,591 in 1888 and 77,559 in 1887; the export this way was respectively 87,286, against 68,347 and 58,058. We quote, large lines, ordinary brands, ℔ box: Siemens-Martin Steel, Charcoal finish, $4.80 @ $5.50; Coke finish, $4.60 @ $4.70; Ternes, $4.12 @ $4.30; Coke Tins, $4.25 @ $4.35, and Wasters $4.12½ @ $4.15.

Lead.—While the Treasury has the Mexican Ore question under consideration, no further sales of Common Domestic to consumers have transpired in this market to speak of, the quotation at the close being 3.80¢ @ 3.90¢, nominally.

Spelter.—A much better feeling and more doing locally can be reported, hence

we have now to quote Common Domestic 4.80¢ @ 4.85¢, below which figure nothing can be had, while with the rise in Europe Silesian cannot be sold for less than 5½¢.

Antimony.—While the demand has remained moderate, prices have gone on stiffening in response to the higher London ruling, so that we can now quote Hallett's 12⅜¢ @ 12½¢, and Cookson's 13½¢ @ 13½¢.

The annual report of the Rio Tinto Mining Company has just reached us. The company have a share capital of £3,250,000, £2,182,140 first mortgage 5 % bonds and £1,127,180 second mortgage 5 % bonds. The gross earnings, including balance of £27,269, were £1,142,778. The net earnings were £754,706. An interim dividend of £325,000 was paid during the year, and a further dividend of £227,500 is recommended, making £552,500, or 17 % on the par value of the stock, carrying to revenue account a balance of £202,206. The total quantity of Ore mined was 1,403,633 tons, against 1,182,438 tons in 1887, the average Copper contents being respectively 3.049 % and 2.949 %. The product at the mines was 18,522 tons of 21 cwt. in 1888, against 17,813 tons in 1887. The quantity brought to market was 17,945 tons, in addition to 7830 tons contained in the Pyrites delivered, making a total of 25,325 tons. The report adds: "The Copper stocks, chiefly in Matte and Precipitate, at Huelva and Cwm Avon carried over at cost price amount to 4600 tons." These figures are interesting, in view of the statement made that the Rio Tinto had delivered more than they were entitled to and had pushed production to the utmost by smelting a good deal of Ore in Spain in blast-furnaces.

New York Metal Exchange.

The following sales are reported:

THURSDAY, May 9.

10 tons Tin, May	20.25¢
16 tons Lead, June	3.92½¢
100 tons Lead, June	3.90¢
10 tons Tin, June	20.40¢
20 tons Tin, June	20.50¢
10 tons Tin, June	20.60¢

FRIDAY, May 10.

20 tons Tin, May	20.70¢
10 tons Tin, May	20.75¢
16 tons Lead, September	3.95¢
25 tons Tin, August	20.65¢

TUESDAY, May 14.

10 tons Tin, May	20.60¢
28,000 ℔ G. M. Copper, May	11.05¢
28,000 ℔ G. M. Copper, May	11.00¢

WEDNESDAY, May 15.

10 tons Tin, spot	20.70¢

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, May 15, 1889.

Prices for Chili Bars and Good Merchant Copper advanced on the strength of demand to cover "short" warrants, and reacted on subsequent free selling by agents of the leading mines. Sellers still ask comparatively high prices, which are paid, for special sorts. The Anaconda company has sold 1500 tons Matte at 8/. It is understood that a promise has been obtained from some of the mining companies to reduce their output and allow warrant-holders to share in supplying the trade demand. There is no truth, however, in the statement that holders and producers have entered into an agreement to regulate prices. Negotiations to that end have been dropped since the American delegates sailed.

In a report by the president of the French bank the statement was made that the institution had advanced at the rate of £48 ℔ ton on 1225 tons of Copper. The Mason & Barry Company announce a dividend of 9/ ℔ share, and the report of the company shows that £42,000, the amount owing by the Société des Métaux on two shipments, has been carried forward. The Rio Tinto Company announces a dividend of 14/.

The Block-Tin market has been supported the last few days by purchases for America, and it is stated that there are still a number of orders here unexecuted. Otherwise speculation has been slow, but more purchasing has stiffened prices to £92. 15/ for prompts.

Buyers of Tin-Plate are still waiting for easier prices. The market is overloaded with ordinary grade Coke, but Bessemer and Siemens Cokes are active at an average of 13/9, and, being well booked ahead, makers are very firm. There are now over 375,000 boxes of Plates, all kinds, at shipping ports, or 135,000 boxes more than was on hand at the corresponding period last year.

The strikes in Germany have had some influence upon the Pig-Iron market, it being thought that, should the troubles continue, stock will be taken from Connal's stores to meet the shortage of supplies. This has led to more speculative buying and higher prices for warrants. Very little change has taken place in prices for makers' brands of Scotch, in Hematites or in Cleveland Pig.

In nearly all branches of the Manufactured Iron and Steel trades business continues brisk and prices are strong. Staffordshire Steel-makers have thus far advanced their prices 12/6, bringing the figures for heavy sections up to within 5/ of the price proposed to be fixed by the promoters of the syndicate.

Scotch Pig.—There has been a very fair business with but little change in prices:

No. 1 Coltness,	f.o.b.	Glasgow	55/6
No. 1 Summerlee,	"	"	54/3
No. 1 Gartsherrie,	"	"	52/6
No. 1 Langloan,	"	"	54/
No. 1 Carnbroe,	"	"	47/3
No. 1 Shotts,	"	at Leith	53/6
No. 1 Glengarnock,	"	Ardrossan	51/6
No. 1 Dalmellington,	"	"	46/
No. 1 Eglinton,	"	"	44/

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

Cleveland Pig.—The market without important change; business fair. No. 3 Middlesborough, G.M.B., quoted 39/ prompt.

Bessemer Pig.—A quite active business doing and the market strong. West Coast brands, mixed numbers, 49/ @ 49/6, f.o.b. shipping point.

Spiegeleisen.—There continues to be a brisk demand and prices are strong. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

Steel Rails.—The decline of last week has been recovered and demand is brisk. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

Steel Blooms.—A good demand for these, and prices firm. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There is still a good trade at firm prices. Bessemer, 2½ x 2½ inch, £4. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Transactions moderate, but prices held firmly. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—But little doing in these and former prices asked. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6, c.i.f., New York.

Scrap-Iron.—A moderate business at about former prices. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—The demand moderate and prices unchanged. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin-Plate.—Trade rather slow and prices barely steady. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	13/6 @ 13/9
IC Siemens " " "	14/ @ 14/3
IC Coke, B. V. grade	13/ @ 13/3
Charcoal Terne, Dean grade	12/ @ 12/6

Manufactured Iron.—The market less active than last week, but still a good business doing at steady prices. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars				@	8	5	0
" Common "				@	6	0	0
Staff. Bl'k Sheet, singles				@	7	15	0
Welsh Bars (f.o.b. Wales)	5	5	0	@	5	7	6

Copper.—A fairly active movement. Prices somewhat irregular. To-day's prices for Bars were £38. 15/ @ £39, spot; £38. 15/ @ £38. 17/6, three months' futures. Best selected, £44.

Tin.—Business quite brisk and the market firm. Straits quoted at £92. 12/6 @ £92. 17/6, spot, and £93. 5/ @ £93. 10/ for three months' futures.

Lead.—Trading smaller, but prices very steady. Quoted £12. 12/6 for Soft Spanish.

Spelter.—Dealings continue lively and prices are stronger. Quoted at £17. 15/ @ £17. 17/6 for ordinary Silesian.

Foreign Markets.

EAST INDIES.

PENANG, April 2, 1889.—*Tin.*—Receipts sum up 7400 piculs for the fortnight. Europeans bought 5000 piculs and Chinese 5600. The market gave way from $35.80 ℔ picul to $35.65, but winds up at $36.41, $36.75 having been paid by Chinamen yesterday.—*Schmidt, Kustermann & Co.*

SPAIN.

BILBAO, April 27, 1889.—*Iron Ore.*—Sales for the week have been restricted to a few cargoes Rubio at 7/ @ 7/2. Campanil, always in short supply, may be quoted nominally 8/4 @ 8/8. There being plenty of steamers, shipments have been quite lively. Since January 1 they amounted to 1,310,958 tons, against 1,260,645 in 1888. *Pig-Iron* has been in active request for domestic use, 1146 tons being shipped coastwise and nothing abroad. Spain's metal exportation during the first two months has been as follows:

	1887. Tons.	1888. Tons.	1889. Tons.
Calamine	3,160	2,576	2,313
Pyrites	128,200	113,869	180,156
Iron Ore	845,009	802,369	816,528
Pig-Iron	19,606	5,128	10,433
Precipitate	4,914	3,344	3,811
Quicksilver	228	115	759
Pig-Lead	24,268	23,261	22,648
Totals	1,025,385	950,662	1,036,648

The increase in Quicksilver exportation will be noticed.—*Bilbao Maritimo y Comercial.*

BELGIUM.

BRUSSELS, May 4, 1889.—*Iron.*—The Belgian Iron market remains firm. The demand for Beams has fallen off, but this is hardly perceptible, makers being busy on old orders; ere these are about delivered a revival is likely. Pig-Iron remains stiff; Luxembourg No. 5 Foundry sells with ease at 5.10 @ 5.20 francs ℔ 100 kg., Charleroir at 6.50, and Steel Rails may be quoted at 6.75. The stock of Pig-Iron is on the increase; the export demand is slack. Sheets and Plates are scarce, and orders are declined by makers. The structural iron works are very busy.—*Moniteur des Intérêts Matérials.*

Hardware.

Business in several lines shows an increased activity, and on the whole the volume is fair. While there is more or less complaint in regard to the season's trade, it appears that the amount of goods sold compares well with that of the corresponding time last year; but the profits for manufacturers are less, and jobbers in many cases complain of narrow margins on account of the vigor of existing competition. Prices are without important change, but are not characterized by much strength. Collections are rather slow.

Wire Nails.

The market is without important change, the leading mills being pretty well occupied with orders. Prices are low, and to some extent irregular. A moderate business is doing from store on the basis of $2.55 to $2.65.

Barb Wire.

The market is in a good condition, and while prices remain without change, they are characterized by a good tone. An excellent business is being done by the Eastern manufacturers, who find some difficulty in obtaining Wire as promptly as needed for their orders. Quotations are on the basis of 3.5 cents for carload lots, 3.6 for 3-ton lots and 3.8 cents for small lots, with the usual deliveries.

The Kelly Barb Wire Company and the Western Fence Company have removed their offices to their works at Deering, in the suburbs of Chicago.

Cut Nails.

The volume of business done in the New York Nail market continues quite satisfactory, but prices are still low, our quotations remaining $1.80 @ $1.85 for carload lots on dock.

It is quite generally conceded that the much discussed pool of Eastern manufacturers over which so much time and labor have been spent is dead. It is stated that the refusal of three of the Upper Susquehanna mills to sign killed it.

The regular monthly meeting of the Western Cut Nail Association was held at Wheeling, W. Va., on Wednesday, the 8th inst. The following firms were represented:

LA BELLE IRON WORKS, Wheeling, W. Va.
RIVERSIDE IRON WORKS, Wheeling, W. Va.
JUNCTION IRON COMPANY, Mingo Junction, Ohio.
WHEELING IRON AND NAIL COMPANY, Wheeling, W. Va.
LAUGHLIN NAIL COMPANY, Wheeling, W. Va.
BENWOOD IRON WORKS, Wheeling, W. Va.
BELMONT NAIL COMPANY, Wheeling, W. Va.
SPAULDING IRON COMPANY, Brilliant, Ohio.
JEFFERSON IRON WORKS, Steubenville, Ohio.
BELLAIRE NAIL WORKS, Bellaire, Ohio.
KING, GILBERT & WARNER, Columbus, Ohio.

Nothing but routine business was transacted. Reports from the members showed that there has been no improvement either in the demand or prices for Cut Nails, and future prospects are not encouraging. It was thought that the recent cut made in nailers' wages by the Bellaire Nail Works would be brought up for discussion, but it was not. No date was set for the next meeting.

Miscellaneous Prices.

In the paragraph in our last issue relating to the prices of Thomas Laughlin & Son, Portland, Me., a misleading error occurred by which, through the substitution of *and* for *for*, Tackle Blocks, as well as Iron Sheaves, were quoted at discount 70 per cent. The correct statement would have been that Iron Sheaves *for* Tackle Blocks are quoted from the manufacturers' standard list at the discounts named—that is, Common at 70 per cent., and Patent at 60 per cent. The trade will please note the correction, as Tackle Blocks are not selling at any such price, and in fact are quite firm and in good shape.

The American Brass Kettle Manufacturers, for whom O. W. Graves is agent, 21 Cliff street, New York, are putting on the market this season a line of Brass Kettles *tinned inside*. This is done to meet the demand for such goods, in the use of which there will be no danger of the food being contaminated by its contact with the brass, thus adapting them to more general use and commending them in an especial degree. The Brass Kettles thus tinned inside are made in sizes from 8 to 17 inches, and are sold at an advance of 2½ cents per pound over the regular goods, the prices for the season being 24 cents for the regular goods and 26½ cents for the inside tinned. It is expected that there will be a large demand for these new goods.

The prices of Picks, Mattocks, &c., under the recent arrangement made between the manufacturers are steady and firm, and a satisfactory trade is being done.

There is more or less complaint of irregularity in the prices of Carriage Bolts, and there is some evidence that in one way or another the combination terms are departed from, but in general the arrangement is working pretty satisfactorily, and it is hoped that these irregularities will be corrected.

The Chain market is without material alteration, but it is noticeable that there is a slight tendency toward lower prices. More or less irregularity exists in the prices named by different manufacturers, and some of the leading makers have recently made offers at concessions from prices heretofore prevailing. Existing quotations are recognized as low and some of the manufacturers who are not as completely equipped as the others have some difficulty in meeting the market.

A good business has been done the past spring in Wire Mats, but there are indications that this line of manufacture is becoming somewhat overdone, owing to the number of manufacturers who have entered the field and the extent of their facilities.

In sympathy with the Copper market lower prices are named on Copper Rivets and Burrs, and it is expected that other goods into which Copper enters as an important material will be to a greater or less extent affected by the decline in Copper. Several lines, however, did not follow Copper in its advance and will probably not be materially changed by the reduction in its price.

Some manufacturers are offering Files at lower prices than prevailed a month ago, and this line of goods as a whole is not characterized by much strength. The manufacturers who occupy the first place in regard to quality are able to obtain considerably better prices than others the reputation of whose goods is not so assured.

The Echo Pistol, made by the Hamblin & Russell Mfg. Company, Worcester, Mass., and illustrated on page 757, is put up one dozen in a box, three gross in a case, and is sold to the trade generally at $10.50 per gross.

Trade.

From a special correspondent we have the following advices in regard to the condition of business in Northern Illinois:

Trade through Northern Illinois is good for those who do the most business, while the smaller dealers are complaining of things being dull. The extremely dry weather has caused a feeling of fear that the crops would seriously suffer, and parties interested in grain and cereals have watched the weather reports from day to day with as much interest as if they were infallible. While rain and local showers have been predicted, dryness has been the result. It is surprising, however, how much dry weather crops will stand when properly put in. During the past day or so, however, some slight showers have relieved the anxiety, and we trust a continuance of these will improve every one's temper. The retail trade is very busy, selling and delivering Gasoline Stoves and Refrigerators, which the extremely warm weather of the past two weeks has created a demand for. In fact, some of the merchants are complaining of overwork in this direction. Modern civilization has created a demand for this class of goods of which our relatives of 50 years ago had no conception. We wonder how, without Screen Doors and Windows, Gasoline or Oil Stoves, Refrigerators or ice, with 10 or 15 children, the grand old hard-working housewife got along at all.

From Salt Lake City, Utah, we have the following advices, which give information in regard to the condition of things in that city and Territory:

The condition of business in general is fairly good. Have recently had fine rains, which have materially improved the growing crops, and the condition of business has correspondingly bettered. Hardware is in good demand. Stocks are full and quite complete and as large as usual. Prices generally are good. The prospects for trade during the next few months are good. Considerable immigration is coming to the Territory from Eastern States. Our best mining camps are producing largely, and some new mines recently opened are turning out well. Prospects for building in this city and principal towns in the Territory are very good, and there will be more building than usual. We have a large amount of good farming lands in this Territory and good crops materially improve general business. The outlook now is rather favorable for moderately good crops. Collections are rather slow in most localities, but as the wool crop will soon be marketed they will doubtless much improve within a few weeks.

From a wholesale Hardware house in Georgia we have the following review of the business during the past 12 months:

Our year's business (1888–89) is fast nearing its close. It will find us highly satisfied with its results, and we are of the opinion that the Hardware trade throughout the State has been very satisfactory. While prices have been quite low on the majority of lines of goods, still the volume of business is very much larger and the prospects are very flattering for a continuance of fair trade even until fall business opens, which is early in July. With us, like many other sections of the South, the building season promises to be one of great activity. There is not an idle mechanic in the city, and not a house under contract but what an occupant only awaits its completion. To be sure, the prosperity of an agricultural country depends on the success of the farmers. Blessed with fairly good crops last year and already under the most favorable circumstances for planting, they have launched out again in good spirits, hoping for another good yield. Under the circumstances we had good collections.

Hardware in Texas.

From the voluminous reports received from our subscribers in all parts of Texas we are enabled to give a general view of the condition of the Hardware business in that State, with a special reference to its course since the first of the year, and the opinion of merchants in regard to the outlook for future business. It is to be noted with gratification that the tenor of the reports received both from the large and small trade is almost uniformly cheerful, the business for the past four months having been in nearly all sections good, and in many cases exceeding in volume that of last year, and in several instances being better than any recent year. At the present time trade is, as usual at this season, comparatively quiet, business holding off until the crops are harvested. The prospects for the crops are uniformly referred to as good at the time of writing, the indications pointing to large harvests, though of course at this time it is impossible to predict with confidence in regard to the outcome. At the present time there is some complaint in regard to collections,

but they have been fairly good during the past season, and are referred to by several of our correspondents as having been exceptionally satisfactory. On the whole the prospects for trade throughout the State are excellent, and the year promises to be, as it has begun, eminently satisfactory. In regard to the central portion of the State we have from one of our correspondents the following advices, which agree with others which we have received:

During the past winter Central Texas (the black, waxy land section) had long-continued rains which thoroughly saturated the earth, started all the springs and filled all the streams, and these rains we count as the foundation for a good crop in every line the coming season, as good full crops can now be made with comparatively light rains during the summer. The acreage in oats and wheat is fully up to the average. The grain now looks well and is beginning to stalk. The corn is all up with a good stand in most localities and full acreage. The cotton acreage will be increased 5 to 10 per cent. Much of the seed is already planted and the ground is in good condition to receive the balance. All considered, our prospects are first-class.

Throughout the State there is good activity in building, and railroad construction in some sections is stimulating business, but in order to give our readers more detailed information of the condition of things in the different parts of the State we make the following abstracts from reports received from some of the principal points:

AUSTIN.—Business is considered fair in general, and about 20 per cent. better than during first four months of last year. The condition of Hardware is somewhat better than other branches of mercantile business. Stocks of Hardware are about as usual. Prices are generally lower than heretofore, which, however, is not attributable to any local causes, our rate of profit being pretty near the same as usual. Prospects for trade during the next few months are better than they have been for several years at same period. There will be nothing beyond the usual amount of improvements. The agricultural condition is good and promising, which inspires confidence and stimulates trade. Collections are better than for several years at this time of the year. Impressions received from traveling salesmen as to business are very good, promising a good trade for next fall contingent upon realization of present agricultural prospects. Reflex of Oklahoma excitement, harbor improvements at mouth of Brazos, development of iron industries in East Texas, &c., will probably cause more rapid development and improvement in our State.

DALLAS.—Trade for the next few months will be light in the interior, but stocks of Hardware are not too large for the requirements of the trade. During the season business has been good, but is now quiet. In this city there will be a good deal of building. The agricultural conditions are promising, but trade will be light until the fall, when if crops are satisfactory an excellent business will be done. An increase in immigration is noted, promising well for future business.

HOUSTON.—The outlook was never better at this time of the year in our section of the country. We believe that our Hardware merchants are doing a very fair business and are in a thrifty condition. Our merchants are well stocked, as largely as at any time for this season of the year. Prices are well maintained in all lines. We have prospects of a splendid business year. Prospects for building are good. Agricultural conditions are very promising in all sections of our State. Collections are good for this time of year. Traveling salesmen report good business. The prospects are good, and we feel confident of splendid developments in the Southwest.

SAN ANTONIO.—General business is very good, as is also Hardware, but it is expected that there will be an improvement in May. Stocks are large in this city and prices have a downward tendency. The prospects for building are excellent, about 80 buildings being in construction, and it is expected that others will be started soon. The prospect for crops is good, and altogether the outlook for business is promising.

WACO.—Hardware is more overdone than other lines and the conditions may be regarded as less favorable in Hardware than in general business. I am under the opinion, which is based on my own observation and the testimony of intelligent traveling men, that Waco has better stocks of Hardware than any other city in the United States not more populous and that has no more territory tributary to it. The general tone of the market is still weak, suffering from congestion caused by chronic overproduction. I look for a turn of the tide before the year is out. The well-known dull period usual at this time of the year in most cotton-growing countries is very apt to be with us at least until August, and longer if the crop prospects should be unfavorable then. The prospects for building are not good, as we have more storehouses now than are likely to be needed in two years, and plenty of dwelling-houses for present wants, and farmers are mostly financially unable to attempt any improvement this summer. Prospects for a good crop were never better at this time of the year than they are now, but a prudent buyer never buys on crop prospects in Texas, for "there is many a slip 'twixt the cup and the lip." Considering past crop failures collections are reasonably good at present. A dull trade is expected until the crops are assured and a brisk trade afterward. The railroads are discriminating strongly in favor of the water points and against the interior cities. If this discrimination is continued for five years almost the entire jobbing business will be driven away from the interior of Texas to the shores of the Gulf and the banks of the Mississippi River.

WEATHERSFORD.—Business is brisk in farming implements, but Builders' Hardware rather quiet. Building is fair, more or less going on all the while. The agricultural conditions very encouraging and wheat and oats look well, with a fair acreage. Large crops of cotton and corn planted. Stock interest is rather flat. A fair prospect for trade.

Items.

We have received from the Gilbert & Bennett Mfg. Company, 148 Lake street, Chicago, a copy of their catalogue No. 110, which has just been issued. It consists of 80 pages of illustrations and descriptive matter, covering an immense variety of Wire Goods, Wire-work, Wire Cloth, Netting, Fencing, &c. The goods shown embrace Tools, Domestic Implements, Ornamental Wire-work, and all kinds of ingenious devices into which Wire is capable of being formed. It is only by glancing through such a catalogue as this that a true conception is obtained of the important part now occupied in the industrial world by Wire. Full price-lists are printed in connection with the several articles. A complete alphabetical index is an important and very useful feature of the catalogue.

E. Bement & Sons, Lansing, Mich., issue a circular relating to patents on Harrows controlled by them, and refer to J. M. Childs & Co., Utica, and A. W. Stevens & Son, Auburn, N. Y., as the only concerns authorized to manufacture under their patents.

A recent issue of *Health* has an article entitled "A Good Filter," in which a description is given of the Filter manufactured by the Gate City Stone Filter Company, 46 Murray street, New York. It also emphasizes the importance of filtering water in order to remove impurities.

W. R. Baker Mfg. Company, Watertown, N. Y., have issued a neat catalogue of nearly 100 pages, showing the line of Hardware specialties which they manufacture, together with a general line of Trimmings and Hardware for canoes, pleasure boats and yachts, inside and outside Brass Fixtures for banks, offices and residences. It will be remembered that this company succeed W. R. Baker & Son, and in the circular to the trade it is stated that the change gives them considerable additional capital, and enables them to enlarge their plant and increase their manufacturing facilities. Additions to their present three-story building are in course of construction. It is intimated that in addition to their regular line of Boating Hardware, their factory will be equipped for the manufacture of Hardware specialties of every description, and that they will add various other goods.

Brewer Bros., Philadelphia, Pa., have issued a new catalogue which is exceptionally complete in its representation of Wrought Goods, of which a large variety is shown with illustrations and list prices. In addition to the more common line of Hooks, Staples, Meat, Awning and other Hooks, a variety of Mirror Hooks, Stay Nails, Hitching Hooks and Rings, to drive, screw or lead in, Sign Hooks, Nail Drags, Corner Braces, Mending Plates, and many other goods are shown. The catalogue is neatly printed, and will be found very convenient.

The motion made recently in the United States Circuit Court in behalf of the Enterprise Mfg. Company for a preliminary injunction to restrain Peter Deissler from manufacturing and John Wanamaker from selling a meat-cutting machine, alleged to be an infringement of the plaintiff's rights under a patent, was disposed of by Judge Butler, May 10. The writ was refused for the present, the court giving the defendants the option to either enter security and render an accounting of profits from the present time until the matter came to final hearing or have the preliminary injunction granted. An order was directed to be entered in accordance with this decision.

Sidney Shepard & Co., Buffalo, N. Y., have issued a new catalogue of nearly 200 pages, which represents the line of goods manufactured and for sale by them. A full-page illustration is given of their handsome store and views also of their works. The extent and variety of the manufactures of the house is indicated in the fact that 133 pages are devoted to their representation, including a large assortment of Tin-Ware with many interesting specialties, and such other goods as Dripping and Fry Pans, Bath-Tubs, Kettle Spouts, Handles, Ears, &c., Dampers, Damper-Clips, Stove-Boards, Japanned Ware, Mincing-Knives, &c. An interesting variety of house-furnishing goods, including Refrigerators, Bird-Cages, Wringers, Stove-Polish, &c., are shown, and a line of Tinmen's Tools and Machines. The extent of their line of Tinners' Supplies is to be especially noted. Many of the specialties shown in this catalogue are also widely known, and among them may be mentioned Bread-Raising Pans, Gem or Muffin Pans, Buffalo Drinking-Cups, Oblong Dinner-Pails, Buffalo Family Oil-Cans, Sieves, Egg-Beaters, Milk-Cans and Fixtures, the Shaker Flour-Sifters, and Grocers', Druggists' and Spice Dealers' Tin-Ware. Owing to the weight of the catalogues they will not be sent by mail, but it is stated that they will take pleasure in packing a copy of the same with the first order received from their customers. The list is accompanied by a revised list of prices of Pieced Tin-Ware, in which a general reduction is noted.

Announcement is made by Aquila Rich, 84 William street, New York, that having withdrawn from the firm of C. T. Raynolds & Co., with whom he has been identified for the past 30 years, he has formed the Aquila Rich Paint and Color Company for the purpose of continuing the manufacture, importation and sale of Dry Colors, Paints in Oil and Japan, Varnishes and Artists' Materials.

The Chapman Mfg. Company, Meriden, Conn., in addition to their old lines, Saddlery Hardware and Sleigh Bells, have recently begun the manufacture of Dog-Collars, of which they have a number of new styles. They state that in connection with the other branches of their business they are enabled to produce Dog-Collars at exceptionally low cost. An addition to their factory is in process of erection, designed especially to accommodate the Dog-Collar department.

Albert Geiger, 6 Oliver street, Boston, Mass., calls attention to a valuable business property in his advertisement on page 49. It includes the machinery and tools, with buildings, lands and leasehold, formerly

occupied by Welch & Griffith. The property is situated on Grove street, in Arlington, Mass., and is referred to as well adapted for manufacturing purposes, having both steam and water power.

The Canton Saw Company, Canton, Ohio, issue neat colored lithographs calling attention to Class' See-Saw and Merry-Go-Round, which they are manufacturing. It is made in two sizes, one intended for the lawn and the other for the parlor or nursery.

A recent number of the *Evening News*, Detroit, Mich., contains a portrait of L. W. Sprague, senior member of the firm of Sprague Bros., well-known Hardware merchants, Greenville, Mich., and gives a sketch of his life, with reference to some of the qualities which have given him the prominent position he occupies.

Farwell, Ozmun, Kirk & Co., St. Paul, Minn., have issued a Hardware catalogue which will rank with the largest and most complete. It consists of 1120 large pages, which are well occupied in the display of a very extensive line of Hardware and related goods. The extent of the assortment is indicated by the fact that the first department of the catalogue is devoted to Mechanics', Lumbering and Tinners' Tools, in the display of which 230 pages are occupied. Builders' Hardware follows, covering Locks, Padlocks, Butts, Hinges, Bolts, Door-Bells, &c., Drawer-Pulls, Coat and Hat Hooks, Screws, Wire Nails, &c., in the display of which 342 pages are employed. The next section covers Miscellaneous Hardware, including such goods as Bolts, Rivets, Tacks, Horse Nails, Saddlery and Wagon Hardware, Whips, Chain, Brushes, Shovels, Steel Goods, Lawn Mowers, Scales, Bells and many others, this section ending with page 758. The remainder of the catalogue is devoted to the following departments: Sporting Goods, Fishing Tackle, Pocket and Table Cutlery, Carvers, Plated-Ware, &c., Granite Iron-Ware, Tin-Ware and House-Furnishing Goods, Indurated Fiber-Ware, Wooden-Ware, &c., Tinners' Trimmings. It will thus be seen that the arrangement is systematic and convenient. The index is also exceptionally complete, every compound word being indexed by both letters, making it easy to find an article under either heading. The manner in which the different goods are arranged with a view to economy of space, effectiveness of display and convenience of reference, as well as the arrangement of the catalogue as a whole, reflects credit on A. E. Allen, by whom the volume has been compiled, while the extent of the book and the large and varied line represented in it indicate the enterprise of the company and the important position occupied by them in the trade. The printing, electrotyping and binding, all of which are very satisfactory, were done by the Pioneer Press Company, of St. Paul, and a large part of the wood engraving by the Art Engraving Company, of that city.

The Allendale Lock Company, Lancaster, Pa., have issued an illustrated and descriptive catalogue, showing their recent improvements in Scandinavian Padlocks, and giving a full description of their new Padlock with patent tumbler, of which we recently gave a description. A line of Malleable-Iron Padlocks is also shown. The company have discontinued the manufacture of the old-style Red Lock, and state that they will hereafter manufacture only goods of the first quality.

D. G. Gautier & Co. are occupying 114 John street, New York, as a Steel warehouse and carrying a full line of Merchant Steel. They call attention especially to their individual brand of High-Grade Tool Steel, which is controlled solely by them, and allude to their extra and special grades as equal to any English brand of Tool Steel made. They will also carry in stock the regular sizes of Machinery Steel, Spring Steel, Toe-Calk Steel, Tire Steel and Cold-Rolled Shafting manufactured by the Gautier Steel Department of Cambria Iron Company. They also allude to their arrangements for furnishing Die-Blocks, Steel Forgings and other shapes and grades of Steel not usually carried in stock.

The suit brought by the Chas. F. Henis Company, Philadelphia, against Paine, Diehl & Co., of that city, for infringement of patents on the Henis Press and Vegetable Strainer has been decided in favor of the plaintiffs and an injunction granted.

Merchandise Brokers in Southern California.

Southern California, with its development and its increased importance as a mercantile field, is showing a disposition to assert itself, and claims more consideration in trade matters than it has heretofore received. One grievance of which they complain is the establishment of agencies for the Pacific Coast with headquarters at San Francisco, making the point that Southern California, having so important a trade center as Los Angeles, should receive more consideration and have agencies established there. On this point a recent issue of the *Commercial Bulletin* of Los Angeles says:

It is high time that the merchandise brokers of Los Angeles arose and made vigorous protest against the establishment and maintenance of Pacific Coast agencies with headquarters in San Francisco. Before going further we wish it understood that the following remarks are intended to apply only to parties doing a brokerage business, and are not intended for wholesale grocers or jobbers, who, although "agents" for large manufacturing firms, purchase their goods. We consider that these parties are not included in the category. If Eastern manufacturers and importers could be induced to realize the fact that the Pacific Coast embraces a stretch of country equal in extent to the area from Pensacola to Maine and from New York to Chicago, and that California, Arizona, Nevada, Montana, Oregon and Washington Territory cannot be compressed into the space occupied by the New England States, they would or should at once come to the conclusion that one general agent for this enormous empire is altogether insufficient to cover the field as it should be. Before Southern California attained the prominence and population it now possesses a Pacific Coast agent in San Francisco (500 miles away) was sufficient, but now it is an altogether different proposition.

Many of these Pacific Coast agencies were abolished when investigation revealed that Southern California has become a populous, busy section, and that Arizona was developing a market for Southern California's products. Investigation also brought to light the fact that Los Angeles was a teeming distributive point of nearly 100,000 inhabitants, and that the "Pacific Coast agents" in San Francisco depended on sub-agents in Los Angeles for the sale of their goods. Having to divide their commissions with the San Francisco men, a feeling of discontent very naturally arises among local brokers, and the attention which is necessary to insure success is lacking. If Eastern parties manufacturing, wholesaling or jobbing special lines of goods wish to obtain a market in Southern California and Arizona they must establish agencies in Los Angeles, covering that field, and not depend on the half-hearted half-paid work which is being performed under existing circumstances.

Binder Twine.

The feasibility of manufacturing Binder Twine in the prisons of Illinois has been receiving consideration, and we give below an extract from the report of the Commissioners of the Southern Illinois Penitentiary, which was recently submitted to the Legislature. After referring to the factories in that State and the manner in which their information was obtained, the commissioners say:

We find that the present market price of Sisal Grass is about 11 cents; Manilla, from 13 to 14 cents per pound. These are combined in about equal parts in the manufacture of Binding Twine, making the cost of the raw material for this class of Twine about 12½ cents per pound. Hemp is somewhat cheaper. Whether this price is produced by the Twine Trust or by the increased demand, or both, we are unable to ascertain. The machinery for manufacturing the Twine is complicated and expensive, being covered by patents and manufactured by but one or two firms in the United States. In fact, the factory at Champaign is now putting in some improved machinery manufactured in Europe. Manufacturers offered to furnish us machinery on the cars in New York for about $7000 for each ton of producing capacity per day. That is to say, the machinery for a factory that would turn out 10 tons of Twine per day, or 3000 tons per annum, and to give employment to 50 prisoners, would cost, delivered in Illinois, $70,000, plus the freight. It is estimated that there was used in Illinois more than twice this amount of Twine last year. From the above it would seem that a factory containing machinery costing $150,000, and employing 125 convicts, ought to very nearly, or quite, supply the demand for Binding Twine for Illinois. As to the feasibility of starting such a factory in one of the prisons of this State, we do not doubt it can be done. But nothing can be accomplished in time for the present season. Machinery must be manufactured to order. It is not kept in stock. Factory buildings must be erected, steam-power must be supplied, raw material must be purchased, skilled mechanics must be found and employed, convicts must be taught the use of the complicated and delicate machinery. All this takes time and money, as any other manufacturing industry does. If the prisons of our State can, consistently with our amended Constitution, be employed at any remunerative labor we do not see why this is not a valuable field toward which to direct that labor. It is true it can only give employment to a few of the many that will soon be out of employment, but, so far as it goes, it will probably conflict less with the skilled mechanics of the State than any other manufacturing industry that can be carried on by the convicts, and if it will so employ them and at the same time grant any relief to our heavily-burdened agricultural interests it is certainly worthy of a trial.

Exports.

BY BARK SVANEN, APRIL 22, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Arkell & Douglas.—3 dozen Meat Cutters, 2200 pounds Fence Wire, 6600 pounds Fence Wire, 6600 pounds Fence Wire, ¼ dozen Churns, 3 dozen Axes, 2 cases Hardware, 2 dozen Scythes, 15 crates Washers, 3 dozen Axes, 9 cases Agricultural Implements, 102 cases Agricultural Implements, 75 reels Barb Wire, 30 cases Agricultural Implements, 26 dozen Handles, 1 case Lampware, 1 dozen Scales, 24 dozen Brooms, 1 case Hardware, ¼ dozen Saws, ½ dozen Carriages 4 cases Meat Cutters, 2 cases Axes, 12 dozen Wash-Boards, 1 dozen Rolling-Pins, 10 boxes Clothes-Pins, 1 case Broom Handles, 12 dozen Pails.

FOR DELAGO BAY.

By Arkell & Douglas.—5000 pounds Barb Wire, 200 pounds Staples, 120 dozen Axes, 5 kegs Nails, 230 dozen Handles, 9 cases Agricultural Implements, 1 bundle Sash Cord, 2200 pounds Sash Weights, 100 dozen Picks.

PER BARK ANNA, APRIL 22, 1889, FOR PORT NATAL, SOUTH AFRICA.

By R. W. Forbes & Son.—30 cases Scales, 4 barrels Hardware, 6 cases Perambulators, 10 boxes Clocks, 16 boxes Axes, 410 dozen Axes, 4 dozen Brushes, 1 case Toys.

By Marcial & Co.—2 dozen Steel Rakes, 14 packages Washing and Wringing Machinery.

By Corner Bros. & Co.—53 cases Tools, 19 packages Hardware, 133 cases Agricultural Implements.

BY BRIG PEERLESS, APRIL 25, 1889, FOR EAST LONDON.

By Arkell & Douglas.—75 cases Agricultural Implements, 15 cases Edge Tools, 3 crates Ranges, 3 boxes Tin-Ware, 20 cases Agricultural Implements, 3 cases Fruit Jars, 4 cases Hardware, 1 case Saws, 1 case Nails, 25 cases Agricultural Implements, 5 cases Agricultural Implememts, 10 cases Axes, 2 cases Handles, 6 cases Axes, 80 cases Agricultural Implements, 9 cases Scales, 1000 Handles, 25 dozen Brooms, 4 cases Drills, 2 cases Handles, 10 cases Axes, 9 cases Hardware, 8 crates Churns, 1 case Saws, 1 case Drawing-Knives, 22 kegs Nails, 1 box Nails, 81 cases Agricultural Implements, 208 Agricultural Implements, 6000 pounds Sash Weights, 14 crates Ranges.

PER BARK HAWTHORN, APRIL 26, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Woodhouse & Stortz.—5 cases Hardware, 40 dozen Edge Tools, 8 cases Slates.

By Coomes, Crosby & Eddy.—60 dozen Brooms, 2000 pounds Nails, 47,097 pounds Wire, 12 gross Shoe Blacking, 504 Plows, 6 Corn Shellers, 1 Plow, 12 dozen Picks, 20 dozen Axes, 156 dozen Handles, 69 dozen Axes, 46 dozen Axes, 66 dozen Hardware, 5 dozen Tools, 1 set Axles, 20 Pumps, 9 Scales, 4 dozen Hardware, 4 dozen Tools, 24 Washing Machines, 25 dozen Axes, 100 pairs Plow Handles, 130 dozen Tool Handles, 4 dozen Axes, 39 Plows and Parts, 12 Children's Carriages, 28 dozen Edge Tools, 2 Scales, 6 Scales, 30 dozen Brooms, 5600 pounds Wire, 30 dozen Brooms, 9 Churns, 2 dozen Well-Wheels, 30 dozen Hammers, 6 Corn Shellers, 40 Scales, 96 Plows, 950 Plow Parts, 1 Plow, 6 Wringers, 12 Ladders, 30 dozen Axes, 36 Children's Carriages, 6 Meat Safes, 6 Children's Carriages, 50 dozen Hatchets, 8 dozen Picks, 33 dozen Brooms, 2 cases Sash Weights.

PER BARK ANTWERP, APRIL 27, 1889, FOR CAPE TOWN, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—1 Carriage, 14 cases Carriage-Ware, 8 Freezers, 4¼ dozen Carpenters' Tools, ½ dozen Stuffers, 6 Churns, 500 Handles, 3 dozen Pails, 2 Tubs, 7 dozen Hardware, 3 dozen Hammers, 9 Carpenters' Tools, 2 Scroll Saws and Lathes, 30 Bird Cages, 3 dozen Traps.

By W. H. Crossman & Brother.—8 packages Hardware, 19 bundles Carriage-Ware, 18 Sewing-Machines, 21 dozen Axes, 1 case Handles, 12½ gross Axle Grease, 5 cases Carriage-Ware, 90 bundles Carriage-Ware, 20 dozen Hatchets, 3 Carriages.

By R. W. Forbes & Son.—1 case Store Trucks, 2 Refrigerators, 1 package Kitchen-Ware, 2 packages Hay-Cutters, 6 dozen Fly-Traps, 3 dozen Grain Cradles, 5 gross Axle Grease, 4 packages Hardware.

By New Home Sewing-Machine Company.—100 Sewing-Machines.

By Coombs, Crosby & Eddy.—7⅓ gross Axle Grease.

By H. W. Peabody & Co.—1 case Hardware, 1035 pounds Blacking, 390 packages Harvesting Machinery.

By Arkell & Douglas.—15 cases Fruit Jars, 2 gross Blacking, 3⅓ gross Axle Grease, 1 gross Traps, 500 Broom Handles, 1 gross Glue.

By Strong & Trowbrdge.- 6 crates Blacking, 21 cases Axes, 24 cases Axle Grease, 4 cases Brooms, 2 cases Carriages, 1 case Broom Handles, 12 bundles Wash-Boards.

By Leaycraft & Co.— 1150 pounds Axle Grease.

By W. B. Fox & Bro.—1660 pounds Brooms, 270 pounds Shoe Blacking, 46 pounds Hardware, 780 pounds Wood Handles.

PER BRIG CURLEW, MAY 7, 1889, FOR PORT NATAL, SOUTH AFRICA.

By W. H. Crossman & Bro.—10,500 pounds Barb Wire, 1 gross Shade Rollers, 9 Meat Choppers, 2 dozen Wood Pails, 6 Scales, 7 packages Lawn Mowers, 500 Handles, 25 dozen Pails, 3 Mangles, 50 cases Clothes-Pins, 45 Pumps, 6 dozen Hammers, 4 boxes Wringers, 15 crates Washers, 32 dozen Tools, 3 dozen Hammers, 1 Scale, 3 dozen Apple Parers, 3 Hay-Cutters, 9 dozen Clocks, 2 2 cases Slates, 50,000 Slate-Pencils, 800 coils Barb Wire, 4 dozen Braces, 2 gross Can-Openers, 3 kegs Nails, 125 cases Plow Parts, 3550 pounds Sash Weights, 75 pounds Cordage, 1 case Hardware.

By H. W. Peabody & Co.—2 gross Blacking, 165 packages Agricultural Implements, 5⅓ dozen Wringers, 233 packages Hardware, 53 packages Carriage-Ware, 18 cases Clocks, 7 packages Lawn Mowers, 1 case Stamped-Ware, 318 dozen Handles, 1 barrel Blocks, 1 case Step-Ladders, 1 case Bolts, 1000 pounds Nails, 3 crates Fiber-Ware, 8 dozen Stamped-Ware, 4 cases Hardware, 36 cases Agricultural Implements, 33 cases Axes.

Dressing Show-Windows.

At the present day there is probably no one feature of the retail store which commands more attention than the show-window, for upon its attractiveness depends in a large measure the success of the dealer. In these times every man is making a hard fight for supremacy, and whatever will conduce to this end is eagerly sought by the wide-awake and progressive business man. He realizes that he cannot afford to sleep while his competitor works, and he is therefore constantly on the alert as to what is taking place about him and takes advantage of all information pertaining to his particular line of trade of which he may become possessed. The literature of the subject is not voluminous, but additions are rapidly being made and much that is interesting and valuable is coming out. The following letter from a correspondent of the *American Storekeeper* contains suggestions which are applicable to more than one line of business, and we republish it for the interest it has for retail stove and hardware dealers:

In all well established and regulated retail stores, with pretensions to carrying any classified line of merchandise, a certain degree of attention is, or should be, paid to the art and underlying principles of window dressing, or, in other words, the more stirring class of merchants who pay prompt attention to advertising and to contriving all possible methods of reaching the attention of customers claim show-windows to be one of the great methods.

I think I am correct in saying that the original design of displaying a line of goods by means of large show-windows is often lost and replaced by a less interesting practice of displaying for display alone. That is, showing the complementary colors and not the class of goods that that immediate locality would be at once interested in. It is very nice for one to be sufficiently talented in the art of window dressing to know just how a general assortment of any particular line of goods should be arranged so that they will strke the public eye in one continuous blend of complementary colors and tasteful arrangement, but at the same time the original and underlying idea should not be lost and overlooked, that of showing such goods in your stock as will strike the feminine eye as being the latest styles, or the masculine eye as rare bargains. By thus arranging the taste to suit the design the window becomes a large and varied column of advertisements.

Thus it is that very often the most artistically arranged windows fail to secure the result intended. Now, do not infer from my last statement that I am opposed to fancy window dressing, for I am not. In my conception of a model store there is nothing that adds more to the beauty and symbolic get-up-and-stir of a retail establishment than that of window dressing, or that has more outward appearance of neatness and system. In this connection it may be said (to my regret) that many win dows are often packed full of the finest and most elegant styles and novelties, and yet without the least trace or show of an underlying idea of system. In conversation with an experienced window dresser the subject of window trimming was broached, and in the course of his (now to me invaluable) remarks he made the statement that one might study the designs and systems of the arrangements of the most tastefully arranged city show-windows, and then make an attempt at reproducing the subject in all its taste, without the pattern right before the eye, and it would be a signal failure nine times in every ten. From this I draw the conclusion that, instead of the pattern, or idea, being before the eye, the eye must be before the pattern, or, in short, the artistic pattern is in the very brain, and can only be carried to perfection by actual experience. Right here I may say that many a time has the window dresser been constrained to tear down his pattern only because it did not suit his inward idea.

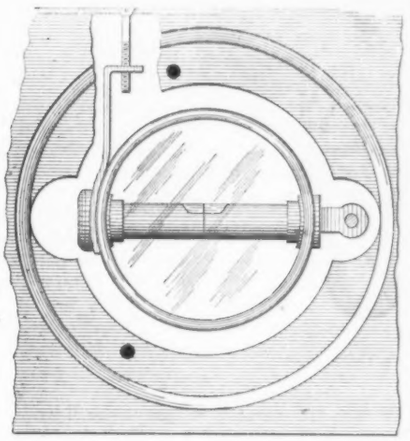
In preparing the window for public attention the dresser must be governed in his taste and arrangement by the class of goods consumed by that particular locality, and not display such goods as belong to the trade of the city merchants. The careful buyer will never have such goods in stock. For illustration, I may say that in the retail dry goods store the display should be made up of goods in which the people are interested and would stop and look at; and when the public eye is forced to pay homage to the window dresser, the original design of window trimming is accomplished—it is then a great advertising medium. In this way, by a careful and not too hasty study, a knowledge of what the trade is most interested in may be acquired; and thus an advertising medium established of as much or sometimes even more value than the long column in the daily or weekly papers. By this expression I do not wish to deny the value of the press as an advertiser, for it is of indispensable value.

The beautiful effect of window shows is sometimes spoiled by a continued sameness. Just as the gossip runs that a new preacher is to preside at the village church next Sunday assures an increased audience to hear something new, so is the effect of a weekly, or, if possible, a semi-weekly, change in the dress of the show-window. The change will always greatly increase the attention of and the interest in that which it contains, so that by so doing people will soon pass your window just to see what you offer new, distinct and apart from the week previous. One would hardly believe such to be the fact unless he actually made the trial. Something I had almost overlooked I must say regarding the consequences of placing too much confidence in certain colors while on display in the window. I can proudly say I have the "consequence" stored permanently in my first experience. Beware of pink and the lighter shades of blue.

They look nice enough in windows, but how disgusting on the job counters. This is why I make this remark, so that an idea may be formed from my own knowledge of perishable colors. Now, I may safely say that in fancy goods stores the window trimming should be always in harmony with the season. There is nothing tha looks more ridiculous to the trained eye than to see the winter window arrayed in summer goods and *vice versa*. The changes from month to month and from season to season should be as harmonious and blending as the growth and change of the flowers of the summer months. What I mean in this connection I may illustrate by saying that it would be quite out of good taste to display to any great degree laces and embroideries in the winter months, when the store is full of goods suiting the season and highly necessary to be shown; or to display any heavy woolen goods in summer, when you have new patterns and fancy styles in dress goods, or other novelties suiting the occasion. A careful attention to this will add greatly to the public interest taken in your windows. I have confined my remarks to dry goods from the fact that they are my "building blocks." I do not pretend to be an expert in window dressing at all, but have been simply giving my idea of showing goods and its general advertising connection with any store. And before I conclude my attempt I must pay a necessary honor to all window dressers. They are one of the invaluable methods of advertising. A well-dressed window is one of the greatest outward expressions that can be given by a progressive store—an ever-telling indication of the live and energetic persons within.

Cook's Spirit Level.

C. E. Jennings & Co., of 97 Chambers street, New York, are introducing to the trade a spirit level known as Cook's patent. Since 1887 some important improvements have been made in the construction of the level, a general view of some of which is presented by means of the accompanying illustration. The engraving represents a section of the level, showing one of the tubes carrying the bubble. This, it will be observed, is set in a frame faced with glass on either side and placed in the body of the stock. Instead of looking at the top and down into a narrow groove as is usually demanded, the construction of the level is such that the eye is directed to

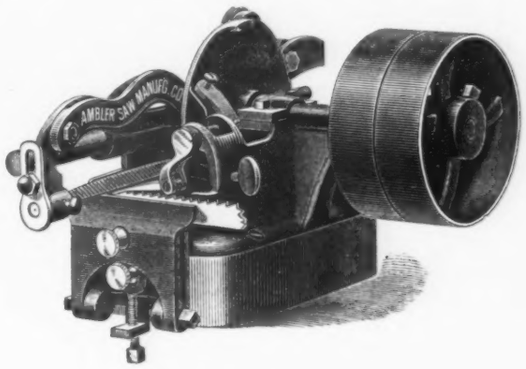


Sectional View of Cook's Patent Level.

the side and notes at a glance the position of the level. There are two of these tubes used in the level, one being designed for testing vertical lines and the other for leveling. The parts holding the tubes are arranged with screws, as will be readily seen from an inspection of the cut. The screw reaches to the plate on the upper edge of the stock, making the level adjustable and possible to correct for any inaccuracy which may exist. The manufacturers direct special attention to these features of the level, and to the fact that it can be used in many positions which is not possible with the ordinary device. It is a carefully made instrument, being highly finished, and in its improved form is expected to prove more popular with the trade than ever.

The Perfect Filing Machine.

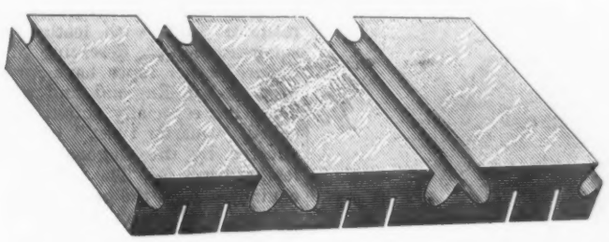
The saw-filing machine of which we herewith present an engraving is made by the Ambler Saw Mfg. Company, of Natick, Mass. The saw is held in a vise, as shown, and is raised and lowered by means of a back gauge placed inside the vise and controlled by a thumb-screw from the bottom. The file mechanism consists of two arms, one with a long straight cam-slot and the other with a curved one, both being in connection with a cam-roll on the face-plate. Each rotation of the face-plate, therefore, gives the file-carriers a reciprocating motion, and, by means of the curved cam-slot, the file is raised at the end of its stroke to free it from the tooth and resumes its position at the proper time to move forward on its cutting stroke. The saw is fed by a pawl cam-follower, all in one piece. The cam-follower being in contact with the cam on the back of the face-plate, as shown in the engraving, each rotation gives it a movement which may be graduated for different lengths of teeth by means of thumb-screws, as shown. The adjustments are quickly made, the time necessary being no more than is always required to put a saw upon ordinary filing-wheels, after which the work is entirely automatic and much more perfect than that done by hand.



The Perfect Saw-Filing Machine.

Combined Sheeting and Lath.

We here present a view of a section of Timby's combined sheeting and lathing, which is being placed upon the market by T. F. Timby, of 32 Warren street, New York City. This lathing is made in 6-inch strips, and so constructed that each section may swell or shrink without affecting those on either side of it. This is accomplished by making in the back deep kerfs which pass the bottom of the face grooves, thus leaving no solid wood on a center line through the board from edge to edge. This sheeting-lath may be used outside as a sheathing and back plastered between the studs, making a frost-proof wall, or it may be used in lieu of lath on the inside. With the studding turned the flat way and set 24 to 30 inches apart, both sides being finished with this patent sheeting-lath, the manufacturer claims that a stronger partition is made than when studding is set 12 inches apart and finished with common lath. The construction suggested above is not only cheaper than the usual form, but is also more economic of room. By the use of this material a solid groundwork for moldings, center-pieces and cornice-work is provided, besides constituting an excellent backing for wainscoting. By the use of this lathing no care in the spacing of joist or studding is necessary, neither are furring strips required, while the peculiar shape of the grooves is such as to firmly hold the mortar in place. It has the further advantage of using less mortar than the common plan. The lathing is made with both edges finished alike, as shown in the illustration presented herewith, and is supplied six pieces in a bunch. It is claimed that the use of this material effects a great saving of studding in partitions, prevents straining or breaking of clinches and cracking and falling off of the plaster, a result, it is said, which no other article of its kind has attained.



Combined Sheeting and Lath, Manufactured by T. F. Timby, New York.

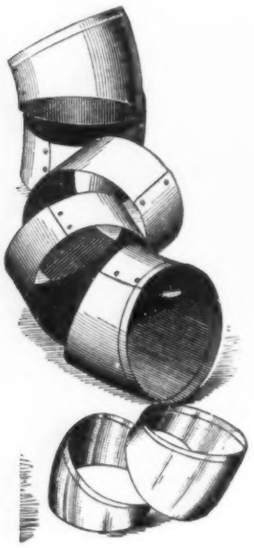
The Torpedo Ventilator.

From one of our English exchanges we reproduce the engraving of a new form of ventilator. The following description, furnished by our contemporary, is not so full as it might be, but the cut shows the principal features of the device: The accompanying illustration shows a new form of ventilator which has been introduced by the Patent Grate Company, Sheffield, as a thoroughly efficient means of preventing down draft and securing an exhaust action under all atmospheric conditions. It differs essentially from all other forms, either of cowls or ventilators, and no matter in what direction the wind may blow, or what eddies may be formed by the wind rebounding from adjacent roofs, the Torpedo acts just as well as under the most favorable conditions. As it is a "fixed" ventilator, and is, therefore, free from all complicated working parts, such as diaphragms or vanes, it is not likely to get out of order, and requires no attention to keep it in a state of efficiency. The London agent is Mr. G. Knowless, Cross street, Finsbury, E. C.

The Torpedo Ventilator.

New Sheet-Metal Elbow.

The National Sheet Metal Roofing Company, of No. 510 East Twentieth street, New York City, are introducing to the trade a sheet-metal elbow for which they make strong claims. The various pieces of which the elbow is composed are formed



New Sheet-Metal Elbow.—Fig. 1.—Sections of Elbow as they come from the Press.

in dies, and when "struck up" present the appearance shown in Fig. 1 of the accompanying illustrations. From an inspection of the pieces in the lower part of the cut it will be seen that the edges are countersunk, allowing the various sections when put together in an elbow to be flush on the outside. The holes shown in the ends of each piece are for rivets to fasten the ends together. One section of elbow is joined to another by placing the lap over a point upon a mandrel and then using a small rivet set, the result being to give to the elbow the appearance of having been riveted. When the parts are fastened in place the whole elbow is galvanized, giving a very neat and smooth finish. In Fig. 2 of the cuts are shown several finished elbows of the kind above described and also an adjustable elbow which may be used in connection with the fixed one, cases often arising where such a combination could be used to advantage. The makers direct special attention to the facility with which these elbows can be put together and the economy in shipping them "knocked down," the construction being so simple that any sheet-metal worker can readily put the pieces together. In case it is desired to secure a supply of these elbows, a portion of which shall be finished and the remainder in sections as shown in Fig. 1, the latter can be packed within the former, thus greatly reducing the space occupied in transportation. The company at present are offering the trade two sizes of elbows, but expect soon to have a full line ready.

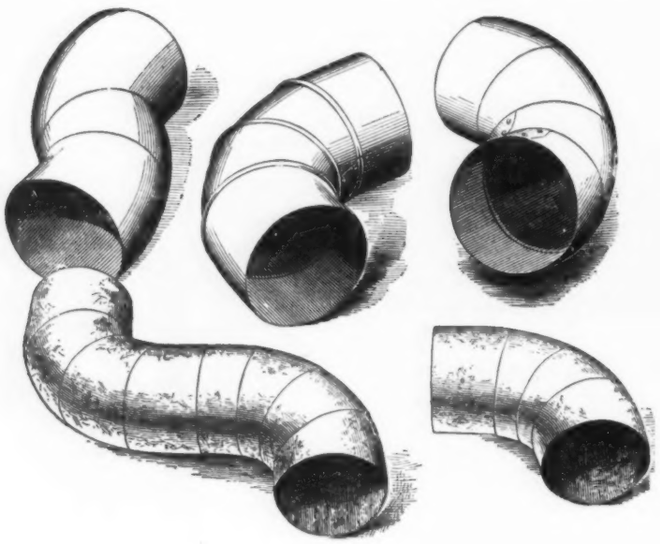
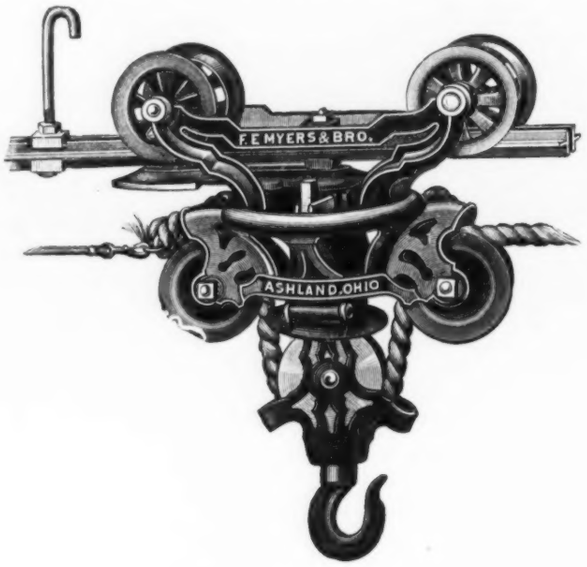


Fig. 2.—Group of Finished Elbows.

Combination Hay Carrier.

F. E. Myers & Bro., Ashland, Ohio, are manufacturing and putting on the market the hay carrier illustrated herewith. This carrier is referred to as composed of new patterns, and adapted to run on the Myers' patent T-rail steel track. It is so constructed that it can be used as a straight reversible carrier. The rope can be drawn through the carrier so that it can be operated either way from the stop. The two pulleys over which the rope is drawn are hung on a turn-table or swivel, thus permitting its use as a swivel hay carrier when desired. It is described as made of the best quality of annealed malleable iron, and is equipped with the double lock trips and stop, which is a prominent feature of their well-known Myers' double-lock reversible carrier. The manufacturers refer to the neat and symmetrical appearance of the apparatus and its substantial construction, as well as its reliability.



Combination Hay Carrier.

Square Driving Ropes.—According to *Industry*, some experiments recently made in India with leather ropes of a square section are deserving of attention. Square leather ropes have for some time been used in England, and with success. They are especially suited for what are called "quarter twist" belts, not being affected by the diagonal strain as a flat leather band is. The sections are square, equilateral, and the grooves in which they run are made to an angle of 45°, so there is a perfect fit of one-half the surface of the rope, and more than is possible with a flat band of equal weight; not only this, the traction is more because of the angles. The square leather ropes employed for main-driving are about 1¼ inches square, made up of layers of leather cemented so the whole is uniform and continuous. A rope of this size weighs 1 pound for each foot of length and will sustain a pull of 600 pounds. A single rope of this size will, at a speed of 2500 feet a minute, transmit 25 horse-power. They are, however, driven at much higher speed than this, in some cases to 6000 feet per minute; a safe or suitable speed is from 4000 to 5000 feet a minute.

This will be a bonanza year for fruit and grain growers in California. The value of the California fruit crop this year is estimated at $24,000,000. The wheat crop is estimated at 70,000,000 bushels, worth $52,000,000.

Valuable iron ore mines which were recently discovered on the banks of the Orinoco River are being worked and the product is ready to be shipped to Philadelphia. The English steamship Cypress will leave with the first cargo of 1800 tons in May, and will receive 15/ per ton freight.

New Galvanized Sprinkling-Pots.

Sidney Shepard & Co., Buffalo, N. Y., are manufacturing the new line of sprinkling-pots which is shown in the accompanying illustration. These pots are fitted, it will be observed, with a new style spout, which is double seamed in and has a delivery orifice extra large. The form of the sprinkler heads is also alluded to. These goods are galvanized after being put together, a process which is referred to as soldering all the seams and coating the entire surface. The goods thus made are claimed to be stronger and more durable than tin and of attractive appearance, while cheaper and more substantial than copper. The reasonable price at which they are sold is especially alluded to.

New Galvanized Sprinkling-Pot.

The Ideal Refrigerator.

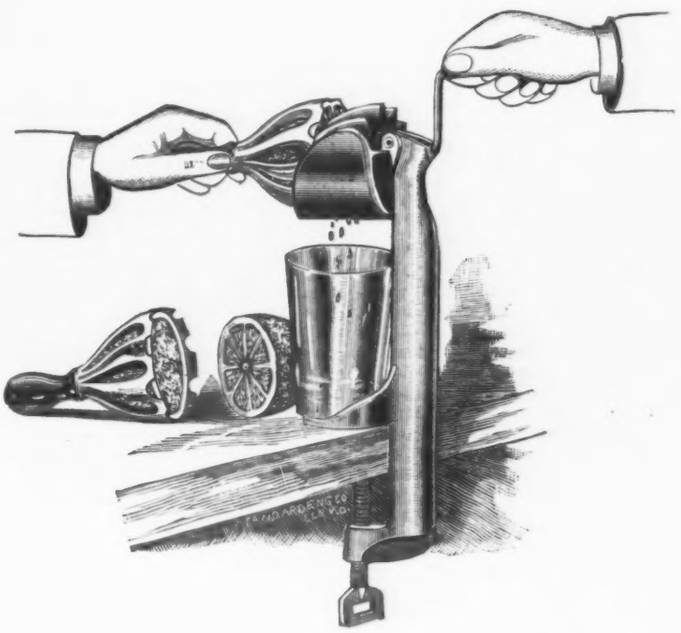
A refrigerator of new and handsome design is offered to the trade by Hibbard, Spencer, Bartlett & Co., of Chicago, who are the sole agents for the manufacturers, the American Fiberware Company, of the same city. An illustration of the refrigerator is shown herewith. It is cylindrical in form, 36 inches high, 22 inches in diameter, and weighs but 40 pounds, being made of compressed wood pulp. The ice is put in at the top, and rests on a corrugated galvanized-iron rack or shelf. The food or provisions are inserted in a door on the side, which opens the full hight of the provision-chamber and flush with the bottom, to render cleaning simple and easy. A full circulation of air is secured by apertures in the ice-chamber which have been arranged for this purpose. The wood pulp being a non-conductor, double walls are not needed, and there is no grain as in wood to shrink or swell, while the inside space is unusually large for its external dimensions as compared with other kinds of refrigerators. It is intended for the use of small families and for dwellers in flats and apartments. It is beautifully painted and decorated in oil colors, and the trimmings are of nickel plate.

The Ideal Refrigerator.

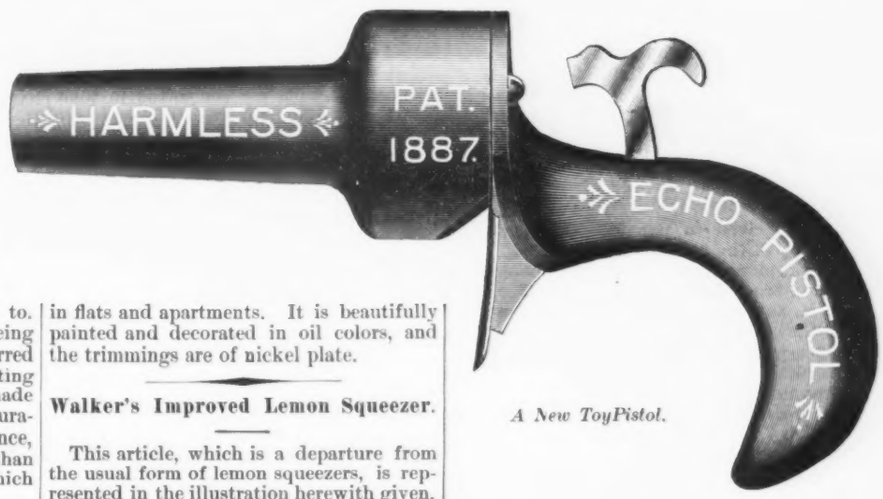
Walker's Improved Lemon Squeezer.

This article, which is a departure from the usual form of lemon squeezers, is represented in the illustration herewith given, and is manufactured by the Erie Specialty Mfg. Company, Erie, Pa. This machine is designed to be clamped to a shelf or table, and is made high enough to allow a glass to be placed under the catch-pan to receive the juice, which is strained as it passes through the slits in it, the seeds and the pulp being thus kept out of the juice, and the point is made that by this operation all the juice is removed from the lemon without crushing the seeds or peel, thus avoiding the extraction of the bitter oil which is detrimental to the juice. It is also claimed that much more juice is in this way secured than with the ordinary squeezer. The standard of the machine and the clamp are made of iron, nickel-plated, while the parts coming in contact with the lemon are enameled to prevent corrosion, there being thus no danger of the deleterious effects which are liable to result from the use of galvanized squeezers. The fluted head and pan are held in place by a split spring-pin, allowing the parts to be taken off for cleaning. The following are the directions for the operation of this machine:

To operate, cut the lemon in halves, placing one piece in the holder and press it in level (allowing it to rest on the pan, which centers it) against the fluted head, at the same time revolve it with the crank a few times, which will flatten out the pulp and extract all the juice, when the peel can be dropped out and the operation repeated. As the oils are all left in the peel, they can be used at a profit for extracts, &c.



Walker's Improved Lemon Squeezer.



A New ToyPistol.

A New Toy Pistol.

The accompanying illustration represents the Echo pistol, which is made by the Hamblin & Russell Mfg. Company, Worcester, Mass., the cut showing it full size. Its construction is exceedingly simple, the handle being made of iron and the barrel of wood handsomely japanned. In operating the pistol a sharp report is produced without the use of powder or caps, but simply by the mechanical operation of the toy. The hammer, shown in the cut, is connected with a piece of steel, the lower part of which is the trigger, and this piece of steel is expanded in the center and given a bound rim, in such a way that it makes a report as it is bent either backward or forward,

and the construction of the large part of the barrel is such as to cause a reverberation, materially increasing the noise. With this construction it will be seen that the report is made in cocking, as well as in firing, the pistol. It can also be made to do service in firing peas or beans. The fact that it is harmless and apparently indestructible are points in its favor. The regular style of the pistol has a bronzed handle, but it is also made nickel-plated. It is intended to retail at 10 cents, and the manufacturers intimate their willingness to send a sample of the pistol by mail at this price.

Legal Decisions.

PARTNERSHIP.

M. received in payment of a debt due him by P. the firm check of P. & Co., and got the money for it. After the dissolution of the firm, W., one of the members, went to M. and demanded from him the amount of the check, on the ground that the money belonged to the firm and had been misappropriated. M. refused to refund and W. brought suit. In the action plaintiff sued for the money or moneys of the firm, and the defendant alleged that no recovery could be had on such a statement of facts, and the court sustained him. The case—Warren *vs.* Martin—was then carried to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Cobb, in the opinion, said: "In an action by copartners against a vendor for the proceeds of a bank-check made by one partner on the firm's bank deposit for goods sold to one member of the firm for his own use, it must be presumed, unless it is alleged to the contrary, that the check was given on account of the partner's interest in the profits of the firm. The rule is when a partner gives the firm check for his own debt it must be presumed that the transaction was fair, and that the debt was paid out of the private funds of the partner indebted. Every check is presumed to be given for value received; it is payable without grace and is an absolute appropriation of so much money in the bank to the holder. To hold the payee to the duty to return the money so received from one partner in payment of his debt it must be made to appear, by allegation and proof, that he knew that the partner was misappropriating the funds of the firm. When there is so much improper appropriation no recovery can be had."

COMMISSION MERCHANTS—FAILURE TO SELL GOODS WHEN ORDERED—FIRE.

P. had on store with L. & Co., who were commission merchants and warehousemen, a number of bales of cotton, which had been delivered to L. & Co. by her tenants, and she instructed them to sell the cotton at a price which could be obtained. She held the warehouse receipts, but they did not demand them when they got the order to sell. The sale was not made, and after a few days the cotton was destroyed by fire. L. went to P. & Co. and demanded from them the value of those bales, on the ground that as they had not obeyed her instructions she could hold them as though they appropriated the cotton to their own use. They refused to pay her, and she sued for the value of the property and received a judgment, from which the defendants carried the case—Lehman *vs.* Pritchet—to the Supreme Court of Alabama, where the judgment was reversed. Judge Clopton, in the opinion, said: "Commission merchants in their business, duties and liability are substantially the same as factors. The relation in both cases is created only when the property is consigned or received, or is placed at the disposal or under the control of the commission merchant to be sold. Whenever he receives the property without special instructions as to the time, mode or price, the duty is devolved to use due diligence to sell in a reasonable time; but the duty is not devolved until he receives such possession and power of disposal and control as will enable him to make an effectual sale—to deliver possession and to pass title. Though L. & Co. were conducting business also as warehousemen, under the title of 'the Alabama Warehouse Company,' they were not bound to carry out Mrs. P.'s orders to sell before she dealt with them as commission merchants, by placing the cotton in their hands for sale, and to this end she should, at the least, have delivered to them her warehouse receipts. We have come to the conclusion that, as to her, L. & Co. were not acting as commission merchants. But conceding that they were acting in this relation to her, still, in our opinion, they are not liable to her for the value of the cotton. The fire here is admitted to have been accidental, and the burning of those bales was an accidental and collateral injury to this property, not usually following as the result of any delay by L. & Co., as commission merchants, in making sale of the cotton. If the defendants were bound to sell in a reasonable time and failed to do so, they would be liable only for any injury naturally resulting from the delay, not from an injury suffered from an extraordinary or fortuitous cause, having no relation to the delay, except that it was contemporaneous. In this case the burning of the cotton was the result of an accidental or collateral injury, between which and the delay in selling there was no necessary or rational connection. The fire must be regarded as the proximate and the delay as the remote cause of the loss of the cotton. The damages against the defendants, which the jury were instructed to give, were too remote, and we must reverse the judgment."

SALE—MONEY PAID TO BE RETURNED IF DISSATISFIED.

P. & Co. made for the T. Mfg. Company a lot of belting, and they gave the purchasers a note for about one-tenth of the price, as a compensation to them should the belting after three years' use show any cause to dissatisfy G., the agent of the T. Mfg. Company, the said note to be paid "promptly on demand of G. or his successor—he was the treasurer of the company—without the intervention of third parties, the matter to rest solely on the decision of G. or his successor." G. declared himself not to be satisfied with the quality and workmanship of the belting after the time limited, and presented the note for payment, but payment was refused on the ground that the belting showed no inferiority after its three years' use, and therefore G. had no reasonable ground whereon to decide that the amount of the note should be paid. Suit was then brought to recover upon the note and the agreement, and P. & Co. set up as a defense the above-stated ground. The company contended that the defense set out was not sufficient in law to prevent judgment being entered for it, and in the case—Terrapee Mfg. Company *vs.* Page—the Supreme Court of Rhode Island gave judgment for the company on the ground that the defense was not sufficient, as stated. The Chief Justice, Durfee, in the opinion, said: "We think the agreement to abide by the decision of G. after a three-years' use of the belting was the very substance of the compromise, and that in the absence of fraud his decision is conclusive. No fraud is alleged in the defense set up; it alleges that the belting answered the requirements of the company, and that G. had no reasonable ground for his decision. But this may be true and yet G.'s decision be honest. The defense must be overruled; the matter of the decision by the terms of the agreement rested solely on G.'s decision. The stipulation was in effect a submission of the matter, after the three-years' use of the belting, to the unconditional arbitration of G., and it is settled that under such a submission the judgment of the arbitrator, fairly formed, is conclusive."

James P. Witherow, the well-known engineer and contractor, of Pittsburgh, and Hon. William L. Scott, of Erie, Pa., with some capitalists of New York City, have recently secured the franchise of a German syndicate in the Sonora Valley, Mexico, and are now hastening the completion of preparations to develop the great anthracite coal deposit there. The vein is 8 feet thick and is 600 square miles in area. It is situated on the International Railway, about 80 miles from the Gulf of Lower California. They will project a railroad to the gulf and will create facilities for supplying coal for the entire Pacific Coast, from Behring Sea to Patagonia, and for the supply of all the Pacific coaling stations. They will ultimately have a number of collieries and will transport their product, as the Philadelphia and Reading Coal Company now do, in their vessels.

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CURRENT HARDWARE PRICES.

MAY 15, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Ammunition.—

Caps, Percussion, ℔ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's.....50¢
E. B. Trimmed Edge, 1-10's....65¢ } 25 @
E. B. Grnd. Edge, Cent. Fire, } 25 &
1-10's.70¢ } 7½ %
Double Waterproof, 1-10's...$1.40
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B.....30¢
Union Metallic Cartridge Co.
F. C. Trimmed.....50¢ }
F. L. Ground.....65¢ } 25 @
Cent. Fire Ground.....70¢ } 25 &
Dbl. Waterproof.....$1.40 } 7½ %
Dbl. Waterproof, in 1.10's...$1.40
S. B. Genuine Imp..orted.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges.
Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting.....15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—
First quality, 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge (list).....30&10&2%
Star, Club, Rival and Climax brands, 10 and 12 gauge.....33⅓&10&2%
Club, Rival and Climax brands, 14, 16 and 20 gauge.....30&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax..65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—
A. M. Co. List No. 19, 1887.....20&10%

Wads—
U. M. C. & W. R. A.—B. E., 11 up..$2.00 }
U. M. C. & W. R. A.—B. E., 9&10.. 2.30 } 25
U. M. C. & W. R. A.—B. E., 7&8... 2.60 } 25 %
U. M. C. & W. R. A.—P. E., 11 up.. 3.10 } 25 %
U. M. C. & W. R. A.—P. E., 9&10.. 4.00 } 25 %
U. M. C. & W. R. A.—P. E., 7&8... 4.90 }
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80

Anvils.—

Eagle Anvils, ℔ 10¢.....20@20&5%
Peter Wright's.....9½¢
Armitage's Mouse Hole.....8¾¢
Armitage's Mouse Hole, Extra.11½@11¾¢
Trenton.....9¼@9½¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....℔ doz $4.75
Antrim Combination.....℔ doz 5.50
Baldwin.....℔ doz 5.25
Champion.....℔ doz 7.25
Eureka, 1888.....each 17.00
Family Bay State.....℔ doz 12.00
Gem.....℔ doz 5.25
Gold Medal.....℔ doz 4.00
Hudson's New '88.....℔ doz 3.75
Ideal.....℔ doz 4.75
Improved Bay State.....℔ doz 30.00
Little Star.....℔ doz 5.00
Monarch.....℔ doz 13.50
New Lightning.....℔ doz 5.50
Oriole.....℔ doz 4.00
Penn.....℔ doz 4.00
Perfection.....℔ doz 4.00
Pomona.....℔ doz 4.00
Rocking Table.....℔ doz 6.00
Turntable.....℔ doz 4.50
Victor.....℔ doz 13.50
Waverly.....℔ doz 4.50
White Mountain.....℔ doz 4.50
72.....℔ doz 4.25
76.....℔ doz 5.75
78.....℔ doz 6.50

Augers and Bits—

Douglass Mfg. Co.....
Wm. A. Ives & Co.....
Humphreysville Mfg. Co.....
French, Swift & Co. (F. H. Beecher, } 70%
Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32½ quarters, No. 5, 85; No. 30, $3.50..20%
Lewis' Patent Single Twist.....45%
Jennings' Augers and Bits.....25%
Imitation Jennings' Bits.....60&60&5%
Pugh's Black.....20%
Car Bits.....50&10&60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....10%

Hollow Augers—
Ives'.....
French, Swift & Co.....
Douglass'..... } 25&10@ 25&10&5%
Bonney's Adjustable, ℔ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25&25&10%

Expansive Bits—
Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ℔ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ℔ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10&5%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood..40&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ℔ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ℔ doz,...40&10%
Pat. Sewing, Long.....℔ doz $1.20
Pat. Peg, Plain Top.℔ gr $10.00...45&10%
Pat. Peg, Leather Top.℔ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ℔ gr $1.70, 35%
Awls, Should. Peg.℔ gr $2.45, 40@40&10%
Awls, Pat. Peg...℔ gr 63¢.....40@40&10%
Awls, Shouldered Brad..2.70 ℔ gr.....35%
Awls, Handled Brad...$7.50 ℔ gr.....45%
Awls, Handled Scratch℔ gr, $7.50..35&10%
Awls, Socket Scratch.℔ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12. 2, $18.....25%
Henry's Combination Haft...℔ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—
First quality.....℔ doz $6.00@$6.50
Others.....℔ doz $5.50@$5.75

Axle Grease—

Fraser's.....Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes.....℔ gr $9.50
Dixon's Everlasting, in bxs...℔ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting...10-℔ palls, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00

Axles—

No. 1.....4¢@4½¢, No. 2 5½¢@5½¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....℔ doz $18....60%

Balances—

Spring Balances.....50%
Common 24-℔.....℔ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Bells—

Hand—
Light Brass.....70&10 @ 70%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent)'.....25&10&35%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10&50%
Crank, Taylor's.....25&10%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow—
Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70&70&10%
Texas Star.....50&10&50&10&5%
Call.....40@40&5%
Farm Bells.....℔ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....50&10&5@60%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....℔ doz $9, 50%
Hotchkiss's.....℔ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9..25&10&5%
McGill's.....℔ doz $3.....10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....℔ doz $3.00, 33⅓%
Excelsior.....℔ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ℔ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ℔ gr..60&10%
Van Sand's Old Pat., $15.00 ℔ gr..55&10%
Washburn's Old Pattern, ℔ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ℔ gr.....$9.00
Security Gravity, ℔ gr.....$9.00

Blind Staples—

Barbed, ½ in. and larger.....℔ ℔ 7½@8¢
Barbed, ⅜ in.....℔ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list revised May 1, 1889.....50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Carriage, Machine, &c.—
Com. list June 10, '84.....75&10&2%
Genuine Eagle, list Oct., '84.....75&10%
Phila. pattern, list Oct. 7, '84, 75&10 @ 75&10&5%
R.B.&W., old list.....70%
Machine, according to size...75&10@80%
Bolt Ends, according to size..75&10@80%

Tire—
Common, list Feb. 28, '83.....70%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....70%
Phila., list Oct. '84.....82½%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84....75&10%
American Screw Company:
Norway, Phil., list Oct. 16, '84....75&10%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....82½%
Bay State, list Feb. 28, '83.....70%
R.B.&W., Philadel., list Oct. 16, '84..82½%

Stove and Plow—
Stove.....65%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....℔ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	..40&10&10	
Jennings	5.50	6.75	..45@45&10	
Other Machines	2.35	2.75		net
Phillips' Patent with Augers	7.00	7.50		

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co..50&10&50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10&70%
Osgood's Ratchet.....40&10&50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10 @80%
Barker's Imp. Nickeled....65&10&70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods..85&10@85&10&10%

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
} Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10&50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—
Wrought Brass.....70@70&10%
Cast Brass, Tiebout's'.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint,
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} .70&10 @75%

Wrought Steel—
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} .70&10 @75%
Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....℔ ℔ 5½@6¢
Dewicks.....℔ ℔ 5½@6¢

Can Openers—

Messenger's Comet.....℔ doz $3.00, 25%
American.....℔ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....℔ doz $3.75, 20%
No. 4 French.....℔ doz $2.25, 55@60%
No. 5, Iron Handle.....℔ gr $6.00, 45@50%
Eureka.....℔ doz $2.50, 10%
Sardine Scissors.....℔ doz $2.75@3.00
Star.....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ℔ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ℔ doz $3.00.....35&5%
Domestic, ℔ doz $2.50.....45%
Champion ℔ doz $2.00.....50%

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.....₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
Parlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed, Plate, Shallow Socket, Deep Socket, Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%
(Brass.....55@55&5%; Others.....60@60&5%)

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6½-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
race, 6½-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ per ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884.....50&10@50&10&5%
American Coil, in cask lots, 3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾ $8.75 6.25 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ¼¢@½¢ ₱ ℔.
German Coil, list of June 20, 1887.....50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter, Hitching and Breast.....50&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5½@6¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W., New Haven, Witherby, Mix.....75&5@75&10%
Ohio Tool Co.....
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00.....30%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....30%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises

Clips—
Norway, Axle, ½ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16...65&5%
Superior Axle Clips 66⅔&5@66⅔&5&5%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....40, &10&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....50&2%
American, Enterprise Mfg. Co.20&10@30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Cork Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
M. S. Mfg. Co. Metal Workers, ₱ gr, $2.50.....25%
M. S. Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubberper doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list.....30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size.....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10&50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75..
Cowell's.....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50.....55&10%
Hercules.....50%
Shaw Door Check and Spring.25@50@35%

Drawing Knives—
Witherby, P. S. & W, Mix, New Haven.....75&5@75&10%
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....30@25%
Ratchet, Moore's Triple Action...25@30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools...$1.75@$1.85

Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse.....50&10&5%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—
Smallsizes.....₱ ℔ 6¾¢
Large sizes.....₱ ℔ 6¼¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ gro $15.00
Rival (Standard Co.).....₱ gro $12.00
Large Duplex (Standard Co.), ₱ doz $4.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $15.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery— No. 4 to 46 gr. | No. 54 to 150 gr. | Flour, CF F FF.
Kegs, ₱ ℔.....4½¢ | 5 ¢ | 2½¢
½ kegs, ₱ ℔.....4¾¢ | 5½¢ | 2¾¢
¼ kegs, ₱ ℔.....5 ¢ | 5½¢ | 3 ¢
10-℔ cans, 10 in case.....6 ¢ | 6½¢ | 5 ¢
10-℔ cans, less than 10.....10 ¢ | 10 ¢ | 7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co. West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10&
60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers' Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ ℔ 6@6½¢

Fifth Wheels.—
Derby and Cincinnati.....4/ & ½

Files—
Domestic—
Nicholson Files, Rasps, &c..60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands 60&10@60&10&10%
Fair brands.....60&10&10&70%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10&60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Imported—
J. & Riley Carr....List, April 1, 1883, 15%
J. & Riley Carr Horse Rasps.....10%
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25&30%
Turton's.....Turton's list, 20&25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4½-inch Rolls.....$3.25 each
Knox, 6-inch Rolls.....$3.60 each } 35%
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors—.....45%

Fodder Squeezers—

Forks—
Hay, Manure, &c., Asso. List.....65%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....60&10&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....50%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10@30%
Henis.....₱ doz $3.75@$4.00
P. D. & Co.....₱ doz $3.75@$4.00
Shepard's Queen City.....40%

Fry Pans—
High List.....75&5@75&10
No. 0 1 2 3 4
₱ doz. $3.75 $4.70 $5.30 $5.95 $6.55
No. 5 6 7 8
₱ doz..... $7.50 $8.75 $10.00 $11.25
Low List.....65&10%
No. 1 2 3 4
₱ doz. $3.00 $3.75 $4.25 $4.75 $5.25
No. 5 6 7 8
₱ doz. $6.00 $7.00 $8.00 $9.00

Fuse— ₱ 1000 ft
Common Hemp Fuse, for dry ground, $2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr., 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water, 12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50&50&5%
Wire, Brown & Sharpe's.....10&20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....40&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25@25&10%
Buffalo Hammer Co.....
Humason & Beckley.....} List Jan. 15, '87 50@50&10%
Atha Tool Co.....
Fayette R. Plumb.....40&10@50%
C. Hammond & Son.....40&10@50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢ } 60&10
3 to 5 ℔.....₱ ℔ 36¢ } &10 @ 70%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢ ₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25%

Handles—
Iron, Wrought or Cast—
Door or Thumb.
Nos. 0 1 2 3 4
Per doz. $0.90 1.00 1.18 1.35 1.50
60&10&10%
Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50 } 30 dis
Hickory Firmer Chisel, large. ₱ gr 5.00 }
Apple Firmer Chisel, ass'd.. ₱ gr 5.00 }
Apple Firmer Chisel, large... ₱ gr 6.00 }
Socket Firmer Chisel, ass'd.. ₱ gr 3.00 }
Socket Framing Chisel, ass'd. ₱ gr 5.00 }
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 2.75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan'.....₱ set $1.00
Hoe Rake Shovels &c.....50&10%

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles, 50¢.. 60%
Champion.....15¢

Hangers—
Barn Door, old patterns...60&10&10@70%
Barn Door, New England..60&10&10@70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4' 2, $10.00; 5 in. $12.00.....50&5@50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00.....50&15@60%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50@50&5%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Steel Anti-Friction.....40&10%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20@20&10%
Stearns' Anti-Friction.....20@20&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....30&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap.33⅓&5
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction.....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood.....35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad.....40%
Buffalo Hammer Co.....40&10@50%
Hurd's.....40&10@50%
Fayette R. Plumb.....40&10@50%
Wm. Mann, Jr., & Co.....50@50&5%
Underhill Edge Tool Co....40&5@40&10%
Underhill's, Haines and Bright....33⅓&5
C. Hammond & Son.....40&10@50%
Simmons'.....40&10@50%
Peck's.....40&10@40&10&5%
Kelly's.....50@50&5%
Sargent & Co.....50%
Ten Eyck Edge Tool Co.40&10@40&10&5%
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—
Lightning..Mfrs'. price ₱ doz $18.00, 25% But jobbers frequently give extras.
Gem.....₱ doz $10
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₱ doz $11.50@$12.00
Heath's.....₱ doz $13.50@14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T.....75&5@75&10%
Screw Hook and Strap: 6 to 12 in., ₱ ℔ .. 3¾¢; 14 to 20 in., ₱ ℔.. 3¼¢; 22 to 36 in., ₱ ℔ ... 2¾¢
Heavy Welded Hook: 6 to 12 in., ₱ ℔.... 3¾¢; 14 to 20 in., ₱ ℔.. 3¼¢; 22 to 36 in., ₱ ℔ ... 2¾¢
Screw Hook and Eye: ¼ in., ₱ doz $1.50; ⅜ in., ₱ doz $2.45; ¾ in., ₱ doz $3.80 — 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges ⅛, 10 & 12 in., ₱ ℔.....5¢
"Providence" over 12 in., ₱ ℔.....4¢
Spring Hinges—
Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Acme and U. S.....30%
Empire and Crown.....20%
Hero and Monarch.....50%
American, Gem, and Star, Japanned.20%
American, Gem, and Star, Bronzed...net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Gate Hinges—
Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%
Blind Hinges—
Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10&5%
Niagara.....80&2½%
Buffalo.....80&5%
Clark's Genuine Pat.....80&5%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75&5%
Queen City Reversible.....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50.....25&2%

Hoes—
Handled—
Garden, Mortar, &c.....65%
Planter's, Cotton, &c.....65%
Warren Hoe.....60%
Magic.....₱ doz $4.00
Eye—
D. & H. Scovill.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat.....60%
Hubbard & Co., S. & O. Pat.....60%
Chattanooga Tool Co., S. & O. Pat....60%
Grub.....60@60&10%

Hog Rings and Ringers—
Hill's Improved Ringers.....₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs.....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.60@1.70
Perfect Ringers.....₱ doz $2.15@$2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 90¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%

Holders, File and Tool—
Balz Pat.....₱ doz $4.00; 25%
Nicholson File Holders.....20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground.....60@60&5%
Unground.....60&10@60&10&10%
Enameled Hollow-Ware—
Maslin Kettles.....65&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40%
Gray Enameled-Ware—
Stove.....50@50&5%
Maslin Kettles.....60&10@60&10&10%
Boilers and Saucepans.....40&5%
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Rustless Hollow-Ware.....50@50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother — 40&5%
Hartford Silver Plate Co, William Rogers Mfg. Co — 40&5&5%

Hooks—
Cast Iron—
Bird Cage, Sargent's list.... Bird Cage, Reading.... Clothes Line, Sargent's list.. Clothes Line, Reading list. 60&10&10%
60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%
Wrought Iron—
Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886.....45%
Wire Coat and Hat, Miles', list April, 1886.....45%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Belt.....75&10@80%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60@10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—

	Nos. 6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin..24¢ 22¢ 21¢ 20¢ 19¢. 40&10@50%
Essex ....28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra.....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Snowden ....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 10&10&5&5%
Globe.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢.20&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 25&10&10%
New Haven..28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell.....28¢ 26¢ 25¢ 24¢ 23¢. 35&5@35&10%
Star.....23¢ 21¢ 20¢ 19¢ 18¢. 10&10@10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed.....14 ₱ ℔.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition.....75&10@75&10&5%
Standard.....70@70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....30&10%
N. Y. B. & P. Co., Extra.....50%
N. Y. B. & P. Co., Dundee.....60&10&5%

Huskers—
Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper.....₱ gr 7.00

Indurated Fiber-Ware.
Spittoons, No. 2, ₱ doz.....$6.75
Basins, Ringed, ₱ doz., No. 1, $3.70; No. 2, $3.10; No. 3.....$2.70
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ doz. nests.....$16.87
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ doz. nests.....$8.37
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ doz. nests.....$6.75
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set.....$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$2.25
See also *Pails.*

Jack Screws—See Screws.

Kettles— Spun. Stamped.
Brass, 7 to 17 in., ₱ ℔.... 24¢ 21 ¢
Brass larger than 17 in., ₱ ℔..... 26¢ 23½¢
Enameled and Tea Kettles. See *Hollow-Ware.*

Keys—
Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo.₱ doz $9.00, 40%

Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives.₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Knobs—
Door Mineral.....65@68%
Door Por. Jap'd.....75@78%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885..40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%

Ladles.— Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₱ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lawn Mowers—
Standard List.....50&10%
Quaker City.....60&10%
Enterprise.....60&10%

Lanterns—
Tubular—
Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards.....$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved.....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....50@50&5%
King.....40&5%

Lines—
Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.....25&10@33⅓&5%
Mason's Colored Cotton.....5%
Wire Clothes...Nos. 18 19 20
$3.60 $3.00 $2.50

Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
List Dec. 30, '86, chgd Feb. 2, '87.....50&10@60&10%
Mallory, Wheeler & Co., list July, '88 50&10@60@10%
Sargent & Co., list Aug. 1, '88..55&2& 10@60&10&5%
Reading Hardware Co., list Feb. 2, '88. 55@60&10%
Note.—Lower net prices often made.
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
F. Many's "Extension Cylinder" $10,50 ₱ doz.
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Feiter or American.....40&10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Parker and Corbin... List March, '84, rev. Jan. 1, '85..33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓&5
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓&5
Yale.....net prices
Romer's.....25%
Padlocks—
List Dec. 23, '84.....75@75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz. $5, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
Fraim's Pat. Scandavian low list.....60%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%

Lumber Tools.
Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line"..₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00

Lustro—
Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Mallets—
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting...₱ doz $1.50

Mattocks. Regular list....60&5@60&10%

Meat Cutters—
Dixon's ₱ doz.....40&5%

Nos.....	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's ₱ doz.....40&5%

Nos.....	100	150
	$15.00	$18.00

Champion ₱ doz .....40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz..... 70@70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.....	1	2	3	4	B	5
Each.....	$5	$7	$10	$25	$50	$90

Enterprise.....30%

Nos..	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania.....40&10%

Nos.....	1	2	3	00
₱ doz....	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz..... 45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos..5	2	6	8	
	$50	$75	$80	$225 ..... 20@25%

Beef Shavers (Enterprise)..... 20&10@30%
Chadborn's Smoked Beef Cutter. ₱ doz $36.00

Mincing Knives—
Am. (2d quality, ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable. .....₱ doz, $3.00, 25%

Molasses Gates—
Stebbin's Pat..... 70@70&7½%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10
Weed's.....20&10%

Boss, ₩ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Money Drawers....₩ doz, $18@$20

Muzzles—
Safety.....₩ doz, $3.00, 25 %

Nails, see Trade Report.
Wire Nails & Brads, list July 14, '87 70&10%
Wire Nails, Standard Penny...₩ keg $2.50@$2.60

Nail Puller—
Curtiss Hammer.....₩ doz $9.00
Giant, No. 1.....₩ doz, $30.00, 10%
Pelican.....₩ doz, $9.00, 25%
Boss.....₩ doz, $30.00, 30%
Lightning.....₩ doz $21.00

Nail Sets—
Square.....₩ gr., $4.00@$4.25
Round.....₩ gr. $3.25
Cannon's Diamond Point...₩ gr., $12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Nuts—
Nuts, off list Jan. 1, 1888: Square. Hex.
Hot Pressed..... 5.4¢ 5.9¢
Cold Punched..... 5.4¢ 5.5¢
In lots less than 100 ℔, ₩ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—
Government.....₩ ℔ 7¾ @8 ¢
U. S. Navy.....₩ ℔ 6¾ @ 7¢
Navy.....₩ ℔ 5¾¢@6¼¢

Oilers—
Zinc and Tin.....65@65&10%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&10%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%

Packing, Steam—
Rubber—
Standard.....60&10@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Standard...50&10&5%
N. Y. B. & P. Co., Empire.....70%
N. Y. B. & P. Co., Salamander. ₩ ℔ 65¢, 30%
Jenkins' Standard.....₩ ℔ 80¢, 35%

Miscellaneous—
American Packing.....10¢@11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13¢@14¢ ₩ ℔
Cotton Packing.....15¢@17¢ ₩ ℔
Jute.....7¢@8¢ ₩ ℔

Padlocks—
See Locks.

Pails—
Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shepard & Co.	2.80	3.00	3.40
Iron Clad	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—
Star Pails, 12 qt.....₩ doz $4.50
Fire, Stable and Milk, 14 qt..₩ doz $5.85

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Glit.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&5&60&10%

Picture Nails—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Pinking Irons— ₩ doz 65¢ net

Pipe, Wrought Iron—
List March 23, 1887.
1¼ and under, Plain.....55%
1¼ and under, Galvanized.....47½%
1½ and over, Plain.....67½%
1½ and over, Galvanized.....55%
Boiler Tubes, Iron.
1¾ and under.....57½%
2 in. to 2¾ in.....62½%
3 in. and larger.....65%

Planes and Plane Irons—
Wood Planes—
Molding.....50&5&50&10%
Bench, First Quality.....60&60&5%
Bench, Second Quality.60&10&60&10&10%
Bailey's (Stanley R. & L. Co.).....40&10%

Iron Planes—
Bailey's (Stanley R. & L. Co.).....40&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10%
Victor Planes (Stanley R. & L. Co.).20&10%
Steer's Iron Planes.....35&35&5%
Meriden Mal. Iron Co.'s.30&10&30&10&10%
Davis's Iron Planes...30&10&30&10&10%
Birmingham Plane Co.....50&50&5%
Gage Tool Co.'s Self-Setting.....20&10%
Chapin's Iron Planes.....40&10&5%
Sargent's.....30&10&30&10&10%

Plane Irons—
Plane Irons.....20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros.....30%
Plane Irons, Auburn Tool Co., "Thistle".....40%
Sandusky Tool Co.:
Single and Cut.....30%
Double.....40%
L. & I. J. White.....25%

Pliers and Nippers—
Button's Patent.....30&10&40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₩ doz.....20&10@33⅓%
Humason & Beckley Mfg. Co..50&50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₩ doz, $12.00...30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40&40&5%

Plumbs and Levels—
Regular List.....70&10@70&10&10%
Disston's.....45&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Polish, Metal.
Prestoline.....20&10%
Krestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Pokes, Animal—
Bishop's I. X. L.....₩ doz $6.50
Bishop's O. K.....₩ doz $5.50
Bishop's Pioneer.....₩ doz $3.75
Bishop's American.....₩ doz $3.00

Poppers, Corn—
Round or Square, 1 qt..₩ gr $12.00@15.00
Round or Square, 2 qt..₩ gr $25.00@26.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₩ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $16.00@17.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz $18.00
Kohler's Hercules.....₩ doz $15.00
Kohler's New Champion.....₩ doz $9.00
Schneidler.....₩ doz $18.00
Ryan's Post Hole Diggers...₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50%
Imperial, ₩ doz, $15.....45%

Potato Parers—
White Mountain.....₩ doz $5.00@5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw.....₩ doz $18.00, 20&10%
Disston's Pruning Hook, ₩ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₩ doz $3.75@4.00 net
Henry's Pruning Shears, ₩ doz $4.25@ 4.50 net
Wheeler, M. & C. Co.'s Combination, ₩ doz $12.00, 20%
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, 7.25

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....60%&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55&60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating...60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₩ doz $12.00.....40%

Pumps—
Cistern, Best Makers.....50&10&60%
Pitcher Spout, Best Makers..60&10&60 &10&10%
Pitcher Spout, Cheaper Goods...70&5& 70&10&5%

Punches—
Saddlers' or Drive, good, ₩ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₩ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners'.....₩ doz $1.44, 55%
Tinners' Hollow Punches.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....30&10%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₩ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₩ ft. 7¢
Sliding Door, Iron, Painted, ₩ foot 4¢, 40%
Barn Door, Light. In. ½ ¾ ⅞
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.25

Terry's Wrought Iron, ₩ foot.....4¾@5¢
Victor Track Rail, 7¢ ₩ foot.....50&2%
Carrier Steel Rail, ₩ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods.....65%
Cast Steel, outside goods.....60&10&70%
Malleable.....70&70&5%
Gibbs Lawn Rake.....$12.00, 50&15%
Canton Lawn Rake.....$9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—
J. R. Torrey Razor Co.....20%
Wostenholme and Butcher, $10.00 to £..... 10%

Razor Strops—
Genuine Emerson.....60@60&5%
Imitation "....₩ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₩ doz $2.00
Lamont Combination.....₩ doz $4.00

Rivets and Burrs—
Copper.....50%
Iron, list Nov. 17, '87.....50%

Rivet Sets......50&10%

Rods—
Stair, Brass.....25&2%
Stair, Black Walnut.....₩ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope—
Manufacturers' prices for large lots:
Manila...⅛ in. and larger ₩ ℔ 15¾¢
Manila.....⅜ in. ₩ ℔ 16¼¢
Manila.....¼ and 5-16 in. ₩ ℔ 16½¢
Manila Tarred Rope.....₩ ℔ 15¼¢
Manila, Hay Rope.....℔ ℔ 15¾¢
Sisal...⅛ inch and larger ₩ ℔ 12¾¢
Sisal.....⅜ in. ₩ ℔ 13¼¢
Sisal.....¼ and 5-16 in. ₩ ℔ 13¾¢
Sisal, Hay Rope.....₩ ℔ 12¾¢
Sisal, Tarred Rope.....₩ ℔ 12¼¢
Sisal, Medium Lathe Yarn, ₩ ℔ 11¾¢
Cotton Rope.....₩ ℔ 15@18¢ net
Jute Rope.....₩ ℔ 8¢
1½% for cash in 10 days.

Rules—
Boxwood.....80&10@80&10&10%
Ivory.....50&50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—
From 4 to 10, at factory...₩ 100 ℔, $2.40@$2.55
Self-Heating.....₩ doz $9.00 net
Self-Heating, Tailors'....₩ doz $18.00 net
Gleason's Shield and Toilet.....25%
Mrs. Pott's Irons.....40@40&10%
Enterprise Star Irons.....40%
Combined Fluter and Sad Iron, ₩ doz, $15.00.....45%
Fox Reversible, Self-Fluter ₩ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....8¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30 %

Sand and Emery Paper and Cloth—
List April 19, 1886.....40&10@50%
Sibley's Emery and Crocus Cloth.....30%

Sash Cord—
Common.....₩ ℔, 10@11¢
Patent, good quality.....₩ ℔ 13@13½¢
White Cotton Braided, fair..₩ ℔ 28@29¢
Common Russia Sash.....₩ ℔ 13½¢
Patent "....₩ ℔ 15¢
Cable Laid Italian Sash.....₩ ℔ 22¢@23¢
India Cable Laid "....₩ ℔ 13¢

Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....20&10&5%
B Quality, Drab, 55¢.....20&10&5%
C Quality, White (only).....26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢

Samson—
Braided, White Cotton, 50¢..30&30&5%
Braided, Drab Cotton, 55¢....30&30&5%
Braided, Italian Hemp, 55¢..30&30&5%
Braided, Linen, 80¢.....30&30&5%

Sash Locks—
Clark's, No. 1, ₩10; No. 2, ₩8 ₩ gr..33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....65%&10@65%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60&60&10%
Corbin's Daisy, list Feb. 15, 1886....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60@60&10%
Liesche's, Nos. 100 and 110, ₩ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₩ gro $4.80

Sash Weights—
Solid Eyes.....₩ ton $22.00

Sausage Stuffers or Fillers—
Milas' "Challenge," ₩ doz $20, 50&50&5%
Perry.....₩ doz, No. 1, $15.00; No. 0, $21.00.....50&50&5%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10&30%
Silver's.....40&10%

Saws—
Disston's Circular.....45@45&5%
Disston's Cross Cuts.....45@45&5%
Disston's Hand 25@25&5%
Extras sometimes given by jobbers.
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 27@28¢
Atkins' Hollow Back X Cuts..₩ foot 18¢
Atkins' Mulay, Mill and Drag.....40%
W. M. & C., Hand.....30&5@30&10%
W. M. & C., Champion X Cuts, Regular.....₩ foot 24@26¢
W. M. & C. X Cuts, Thin Back.....₩ foot 27@29¢
Peace Circular and Mill.....45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₩ foot 25¢
Peace Cross Cuts, Thin Back ₩ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—
Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Diamond Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Saw Frames—
White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Saw Sets—
Stillman's Genuine...₩ doz $5.00@7.75, 40&5%
Stillman's Imita.....₩ doz $3.25@5.25, 40&5@40&10%
Common Lever.....₩ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 25@20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$15.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star, ₩9, No. 15, $5.50; 20& 10@20&10&10%
Atkin's Lever, ₩ doz No. 1, $6.00; No. 2, $9.60
Atkin's Criterion.....₩ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....40%
Am. Tool Co.'s Superior.....₩ doz $15, 50%

Saw Tools—
Atkin's Perfection, $15.00; Excelsior, $6.00 ₩ doz.

Scales—
Hatch, Counter, No. 171, good quality, ₩ doz $21.00
Hatch, Tea, No. 161....₩ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.20@2.30
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10%
Riehle Bros.' Platform.....40%

Scale Beams—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₩ doz $4.00. 10%
Box, 2 Handle.....₩ doz $6.00, 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common.....₩ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons...33⅓@ 33⅓&10%
Stearns' Frames and Corners.25@25&10%

Screw Drivers—
Douglas Mfg. Co.....20&10&10%
Disston's.....45&10%
Disston's Pat. Excelsior.....45&10%
Buck Bros.....30%
Stanley R. & L. Co.'s Varnished Handles.....65&10% Black Handles.....60&10%
Sargent & Co.'s No. 1 Forged Blade.....60&10&10% Nos. 20, 30 and 60.....60%&10&10%
Knapp & Cowles' No. 1.....60&20&70% No. 1 Extra.....60@60&10%
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00, 25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw Driver Bits.....₩ doz 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%

Screws—
Wood Screws—List March 1, 1889
Flat Head Iron.....50%
Round Head Iron.....40%
Flat Head Brass.....45%
Round Head Brass...35%
Flat Head Bronze...45%
Round He Bronze.35%
Extras often given by jobbers

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point.....75@75&10%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....60%&10%
Hand Rail, H. & B. Mfg. Co....70&10@75%
Hand Rail, Ann. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent..60&10@60&10&5%
Jack Screws, Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths.....50&2%

Shears—
American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruning Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory. $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ℔ 9¢
1000 ℔ lots.....₱ ℔ 9½¢
500 ℔ lots.....₱ ℔ 10¢

Shot—
(Eastern prices 2¢ off, cash, 5 days.
Drop, ₱ bag, 25 ℔.....$1.16
Drop, ₱ bag, 5 ℔.....20
Buck and Chilled, ₱ 25-℔ bag.....1.41
Buck and Chilled, ₱ 5-℔ bag.....34

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January 1, 1886.....30%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Nov. 1, 1887.20%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co...50&25&10%
Shaker (Barler's Pat.) Flour Sifters.... ₱ doz $2.00
Electric.....₱ gr $18.00
Hunter's.....₱ gr $21.00
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	70¢	90¢
Mesh 20, Nested, ₱ doz..	85¢	$1.00
Mesh 24, Nested, ₱ doz..	$1.00	1.10

Slates—
Sc hool, by case.....40%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60@2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%

Spoke Trimmers—
Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co.50&10&60%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10%
No. 30 Silver Metal.....50&10%
No. 24 German Silver.....50&10
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50 } 4 mos.
Boardman's Britannia Spoons, case lots.....60 } 4 mos.

Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....} 75&10@80%
Nickel-Plated.....}
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....30&5%

Staples—
Fence Staples, Galvanized.} Same price as B'rb Wire.
Fence Staples, Plain.....} See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5@40%

Stone—
Hindostan No. 1, 3¢; Axe, 3¾¢; Slips No. 1, 4½¢
Sand Stone.....₱ ℔ 2½¢
Washita Stone, Extra.....₱ ℔ 19@20¢
Washita Stone, No. 1.....₱ ℔ 14@15¢
Washita Stone, No. 2.....₱ ℔ 10@11¢
Washita Slips, No. 1, Extra..₱ ℔ 36@38¢
Washita Slips, No. 1.....₱ ℔ 24@25¢
Arkansas Stone, No. 1, 4 to in₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ℔ 40¢
Turkey Slips.....₱ ℔ $1.00@1.50
Lake Superior, Chase.....₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—
Joseph Dixon's.....₱ gro $6.00,*10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —%
Lustro.....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ $5.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro $ cans
Yates' Liquid, 2 3 5 10 gal....8¢
₱ gal ..$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—

List, Jan. 2, 1888.—(*Note.*—Some manufacturers are selling Tacks at slightly higher prices than those named):
American Iron Carpet.....80@80&5%
Steel Carpet.....80@80&5%
Swedes Iron Carpet.....80@80&5%
American Iron Cut.....75@75&10%
Swedes Iron.....75&5@75&10%
Swedes Iron, Upholsterers', 75&10@75&10&5%
Tinned Swedes Iron....75&10@75&10&5%
Tinned Swedes Iron, Upholsterers', 75&10@75&10&5%
Gimp and Lace.....75&10@75&10&5%
Tinned Gimp and Lace.75&10@75&10&5%
Swedes Iron Trimmers'.75&10@75&10&5%
Swedes Iron Miners'...75&10@75&10&5%
Swedes Iron Bill Posters' or Railroad, 75&10@75&10&5%
Swedes Steel (Swedes Iron price list), 80@80&5%
Copper Tacks.....50&10%
Copper Finishing, Trunk and Clout Nails.....50&10%
Finishing Nails.....70&10@70&10&10%
Trunk and Clout Nails.70&10@70&10&10%
Tinned Trunk and Clout Nails, 70&10@ 70&10&10%
Basket Nails'.....70&10@70&10&10%
Common and Patent Brads, 70&10@70& 10&10%
Hungarian Nails.....70&10@70&10&10%
Chair Nails.....70&10@70&10&10%
Zinc Glaziers' Points.....50@50&5%
Cigar Box Nails.....50&10@50&10&5%
Picture-Frame Points..50&10@50&10&5%
Looking-Glass Tacks..50&10@50&10&5%
Leathered Carpet.....50&10@50&10&5%
Brush Tacks.....50&10@50&10&5%
Shoe Finders,' List Jan. 2, 1888, 10&10& 10&10&5%
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....30&10&10%
Japanned.....20&10&10%
Double-Pointed Tacks.....85%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Tapes, Measuring—
American.....25&10%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓&5%

Tinware—
Stamped, Japanned and Pl'ced, list Jan. 20 1887.....75@75&5

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ dos, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Jan. 1, 1887-
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....35@40&5%
Oneida Pattern.....70@70&5%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, "Bonanza".....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, "Decoy".....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz 90¢
In full cases.....₱ doz 75¢

Trowels—
Lothrop's Brick and Plastering.....25%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls	22¢	30¢
No. 12, ¼ and ½ ℔ Balls	21¢	29¢
No. 18, ¼ and ½ ℔ Balls	18¢	28¢
No. 24, ¼ and ½ ℔ Balls	18¢	28¢
No. 36, ¼ and ½ ℔ Balls	16¢	27¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.48@50¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....11½¢
3-Ply Hemp, 1 ℔ Balls.....12¢@12½¢
3-Ply Hemp, 1½ ℔ Balls.....11¢@11½¢
Cotton Wrapping, 5 Balls to ℔..15¢@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6½¢@6½¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—

Solid Box.....60@60&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20&5@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%

Wagon Boxes—

Per ℔.....2½¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓&%
Penny's.₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%

Washers—

Size	⅛	5-16	⅜	½	⅝	¾	1
Washers	7	5¾	4¾	3¾	3¼	3¼	3¼

In lots less than 200 ℔, ₱ ℔, add ½¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Well Buckets, Galvanized—
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₱ doz $4.00@.4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
Iron—
Market,
Br. & Ann., Nos. 0 to 18....70&10@75%
Cop'd, Nos. 0 to 18.....70@70&5%
Galv., Nos. 0 to 18.....75&5%
Tin'd, Tinned list Nos. 0 to 18.....67½% Stone,
Br. and Ann'd, Nos. 16 to 18, 72½@ 72½&5%
Bright and Ann'd, Nos. 19 to 26, 75@ 75&5%
Br. and Ann'd, Nos. 27 to 36, 75@10&5%
Tinned.....70@70&10%
Tinned Broom Wire.....70&5@70&10%
Galvanized Fence.....65%
Annealed Fence, Nos. 8 and 9.....75%
Annealed Grape, Nos. 10 to 14.....75%
Brass, list Jan. 18, 1884.....15&20%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin's Steel and Tin'd Wire on Spools, 40%
Malin's Brass and Cop. Wire on Spools 30%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to £. 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₱ ℔
Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting....75@75&5%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30%
Cast Steel.....40%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics'".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co..70&10%
Lamson & Sessions' Engineers'...60&10%
Lamson & Sessions' Standard.....70&10%
Goes' Pattern, Wrought.....} 80@80&5%
Girard Agricultural.....}
Lamson & Sessions' Agric'l.....}
Sterling Wrought.....}
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 80&20@8&25%

CURRENT METAL PRICES.

MAY 15, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :	
¾ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.....	₩ lb 1.90 @ .. ¢
Refined Iron :	
¾ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1½ in..... 4½ to 6 in. x ⅜ to 1 in	₩ lb 2.00 @ 2.10¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.20 @ 2.30¢
Rods—⅜ and 11-16 round and sq..	₩ lb 2.10 @ 2.20¢
Bands—1 to 6 x 3-16 to No. 12.....	₩ lb 2.20 @ 2.30¢
"Burden Best" Iron, base price..	₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price.....	₩ lb 2 80 @ ....¢
"Ulster".....	lb lb 3.10 @ ....¢
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2½¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16.....	₩ lb 2.75	@ 2.80¢	3.25	@ .....¢
17 to 20.....	₩ lb 2.85	@ 3.00¢	3.25	@ 3.50 ¢
21 to 24.....	₩ lb 3.00	@ 3.10¢	3.50	@ .....¢
25 and 26...	₩ lb 3.20	@	3.50	@ .....¢
27.....	₩ lb 3.35	@ 3.37½¢	3.75	@ .....¢
28.....	₩ lb. 3.50	@ ....¢	4.00	@ .....¢
	B. B.		2d qual.	
Galv'd, 14 to 20,	₩ lb, 4.50	@	4.38	@ .....¢
Galv'd, 21 to 24,	₩ lb, 4.87½	@	4.75	@ .....¢
Galv'd, 25 to 26,	₩ lb, 5 25	@	5.12	@ .....¢
Galv'd, 27.....	₩ lb, 5.62½	@	5.48	@ .....¢
Galv'd, 28.....	₩ lb, 6.00	@	5.85	@ .....¢
Patent Planished.....	₩ lb A 10¢		B, 9¢	
Russia.....	₩ lb 9½¢ @ 10¢			
American Cold Rolled B. B.....	₩ lb 5¢ @ 7¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 12 ¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d quality.....	₩ lb 14 ¢
3d quality.....	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	23 ¢
Straits, Pigs.....	22 ¢
English, Pigs.....	22¾¢
Straits in Bars.....	24 ¢

Tin Plates.

Charcoal Plates.—Bright.

			Per box.
Melyn Grade.....	IC, 10 x 14..	$5.75 @	$6.00
" "	IC, 12 x 12..	6.00 @	6.25
" "	IC, 14 x 20..	5.75 @	6.00
" "	IC, 20 x 28..	12.00 @	12.50
" "	IX, 10 x 14..	7.25 @	7.50
" "	IX, 12 x 12..	7.50 @	7.75
" "	IX, 14 x 20..	7.25 @	7.50
" "	IX, 20 x 28..	15.00 @	15 50
" "	DC, 12½ x 17..	5.50 @	5.75
" "	DX, 12½ x 17..	7.00 @	7.25
Call and Grade.....	IC, 10 x 14..	5.75 @	6.00
" "	IC, 12 x 12..	6.00 @	6.25
" "	IC, 14 x 20..	5.75 @	6.00
" "	IX, 10 x 14..	7.25 @	7.50
" "	IX, 12 x 12..	7.50 @	7.75
" "	IX 14 x 20.	7.25 @	7.50
Allaway Grade.....	IC, 10 x 14..	5.00 @	5.12½
" "	IC, 12 x 12..	5.12½ @	5.25
" "	IC, 14 x 20..	5.00 @	5.12½
" "	IC, 20 x 28..	11.00 @	....
" "	IX. 10 x 14..	6.00 @	....
" "	IX, 12 x 12..	6.25 @	....
" "	IX, 14 x 20..	6.00 @	....
" "	IX, 20 x 28..	12.00 @	....
" "	DC, 12½ x 17..	4.75 @	5.00
" "	DX, 12½ x 17..	5.75 @	6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	$4.75 @	$5.00
10 x 20..	7.25 @	7.50
20 x 28..	9.75 @	10.25
IX, 10 x 14, 14 x 20..	5.50 @	5.75
BV Grade.—IC, 10 x 14, 14 x 20..	4.40 @	4.60

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20..	$4.85 @	$4.62½
20 x 28.....	8.75 @	9.25
IX, 14 x 20.....	5.40 @	5.62½
20 x 28.....	11.00 @	11.87½
Abecarne Grade.—IC, 14 x 20....	4.25 @	4.50
20 x 28....	8.45 @	9.00
IX, 14 x 20	5.25 @	5.50
20 x 28...	10.50 @	10.80

Tin Boiler Plates.

IXX, 14 x 28.....112 sheets.....	$12.50 @	$12.75
IXX, 14 x 28..... 112 sheets....	12.75 @	
IXX, 14 x 31.....112 sheets	14.25 @	

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake.....	@ 15¼¢
"Anchor" Brand.....	@ 15 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		23	25	25	26	27	28	31	33
30		72	23	25	25	26	28	30	34	....
36	96		25	25	25	27	29	33	36	....
36		96	25	25	26	28	30	34	38	....
48	96	—	25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96	—	25	25	30	32	37	....	....	....
60		96	25	26	31	....	....	....	....	....
84	96	—	26	27	..	....	....	....	....	....
84		96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	...	....	....	....	....	....

All Bath Tub Sheets....	16 oz.	14 oz.	12 oz.	10 oz
Per pound....	$0.28	0.30	0.32	0 35

Bolt Copper, ⅜ inch diameter and over, per pound..... 25¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	28¢
12 ounce and up to 14 ounce to square foot.....	29¢
10 ounce and up to 12 ounce.....	31¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢

For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888.....Net

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1½
8-14	6-12	38	34	31	30	29	28	25
15	13	39	34	32	31	30	29	26
16	14	40	35	33	32	31	30	26
17	15	41	36	34	33	32	31	27
18	16	43	37	35	33	31	31	28
19	17	44	38	36	35	34	33	30
20	18-19	45	40	38	37	36	35	32
21	20	47	42	40	39	38	37	35
22	21	49	43	41	40	39	38	37
23	22	51	45	43	42	41	40	40
24	23	54	47	45	44	42	41	42
25	24	57	50	47	46	45	44	46

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch.....	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch.....	$1.00
Plain, ⅛ inch.....	1.50
Fancy Tubing, Brass, to No. 20, inclusive.....	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list.....	20 %

Roll and Sheet Brass.

Discount from list..... ..... 10 @ 15 %

High Brass Rods.

Over 1 inch diameter.....	27¢
¼ inch to 1 inch diameter, both inclusive.....	24¢
No. 8 and less than ¼ inch diameter.....	26¢
Smaller than No. 8.....	30¢
Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	5¼¢ @ 5¾¢
"Bergenport"	.8¢
"Bertha".....	7¾ @ 8¢

Zinc.

Duty: Sheet, 2½¢ ₩ lb.

600 lb casks.....	6½¢
Per lb	7½¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4½¢
Newark	4¼¢
Bar.....	4¾¢
Pipe, subject to trade discount....	5½¢
Tin-Lined Pipe, subject to trade discount.....	15¢
Block Tin Pipes, subject to trade discount.....	45¢
Sheet, subject to trade discount.....	6½¢

Solder.

⅛ @ ⅛ (Guaranteed)...	14½¢
Extra Wiping	12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson...	₩ lb 13¾¢ @ 14¢
Hallett's	" @ 13¢

Fittings.

Cast Iron Fittings, Black and Galvanized, Standard sizes.....	70&10 %
Cast Iron Fittings, Bushings and Plugs.....	75&10 %
Cast Iron Fittings, Flanges.....	70&10 %
Malleable Iron Bushings.....	75&10 %
Malleable Iron Unions.....	67½ %
Malleable Iron American Unions.....	55 %
Wrought-Iron Nipples.....	70&10 %
Wrought-Iron Couplings.....	70 %
Wrought-Iron Long Screws.....	70 %
Casing Fittings.....	60 %
Malleable Iron Fittings.....	25 %

Valves, Cocks, &c.

Iron Body Valves.....	70 %
Throttle Valves, Iron Body.....	70 %
All-Iron Valves.....	65 %
Compression Gauge Cocks.....	60 %
Mississippi Gauge Cocks.....	60 %
Register Gauge Cocks.....	65 %
Air Cocks and Radiator Air Cocks.....	65 %
Steam Gauge Cocks.....	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle.....	65 %
Globe Oil Cups.....	55 %
Common Lubricators.....	65 %
Lubricators with Air Cocks.....	65 %
Iron Body Lubricators.....	60 %
Steam Whistles.....	65 %
Whistle Valves	65 %
Water Gauges.....	65 %
Brass Expansion Joints.....	55 %
Pump Valves.....	65 %
Soldering Unions.....	65 %
Soldering Nipples.....	70 %
Brass Unions (Union Joints).....	65 %
Radiator Nipples.....	60 %
Fusible Plugs.....	60 %
Oil Pumps.....	55 %
Self-Acting Air Valves.....	65 %
Vacuum Valves.....	55 %
Steam Swing Joints.....	55 %
Iron Strainers.....	55&10 %
Jenkins' Iron Body Valves, except Gate Valves..	60&10 %
Jenkins' All-Iron Valves, except Gate Valves....	60 %
Jenkins' Iron Body Gate Valves.....	55 %
Jenkins' All-Iron Gate Valves.....	55 %
Iron Cocks, all Iron.....	65 %
Iron Cocks, with Brass Plugs.....	65 %
Brass Globe, Angle and Cross Valves.....	65 %
Brass Globe Valves, Finished.....	45 %
Brass Globe and Angle Valves, hose outlet.....	65 %
Brass Garden Hose Valves.....	65 %
Brass Caps for Hose Valves.....	60 %
Brass Horizontal, Vertical and Angle Check Valves.	65 %
Brass Safety Valves.....	65 %
Brass Safety Valves, low pressure.....	65 %
Brass Safety Valves, low pressure, with balance weight.....	65 %
Brass Butterfly Valves.....	55 %
Brass Throttle Valves.....	55 %
Brass Radiator Valves.....	65 %
Brass Radiator Valves, Jenkins'.....	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves.....	65 %
Brass Jenkins' Gate Valves.....	50 %
Brass Steam Cocks.....	60 %
Brass Gas, Meter and Union Meter Cocks.....	60 %
Brass Fittings, Rough.....	60 %
Brass Fittings, Finished.....	25 %
Brass Bushings.....	60 %

Plumbers' Brass Work.

Ground Key Work, Rough.....	60 %
Ground Key Work, Finished.....	55 %
Compression Work.....	60 %
Compression Work, Grundy, Heavy Pattern.....	55 %
Chain Stays.....	60 %
Iron Boiler Couplings, Ground Face, per set $1.....	net
Basin Plugs.....	60 %
Sink or Bath and Wash Tray Plugs.....	60 %
Basin Clamps.....	55 %

Paints.

Black, Lamp—Coach Painters'.....	₩ lb 22 @ 24¢
" Ordinary.....	6¢
Black, Ivory Drop, fair.....	12 @ 15¢
" " best.....	23¢
Black Paint, in oil.....kegs, 8¢; assorted cans,	11¢
Blue, Prussian, fair to best.....	40 @ 55¢
" " " in oil.....	45 @ 55¢
" Chinese dry	70¢
" Ultramarine.....	18 @ 30¢
Brown, Spanish.....	1¼¢
" Van Dyke.....	10 @ 12¢
Dryers, Patent American..ass'd cans, 9¢; kegs,	7¢
Green, Chrome	15 @ 22¢
Green, Chrome in oil.....	14 @ 18 @ 25¢
Green, Paris.....	good, 20¢; best, 25¢
Green, Paris in oil.....	good, 30¢; best, 35¢
Iron Paint, Bright Red.....	₩ lb 2½¢
Iron Paint, Brown.....	₩ lb 1½¢
Iron Paint, Purple.....	₩ lb 3¢
Iron Paint, Ground in oil, Bright Red....	₩ lb 6½¢
Iron Paint, Ground in oil, Red	₩ lb 5½¢
Iron Paint, Ground in oil, Brown.....	₩ lb 5½¢
Iron Paint, Ground, Purple.....	₩ lb 6¢
Litharge.....	6½¢
Mineral Paints.....	2 @ 4¢